NATIONAL MARINE FISHERIES SERVICE REPORT ON GROUNDFISH MANAGEMENT

National Marine Fisheries Service (NMFS) Northwest Region will briefly report on recent regulatory developments relevant to groundfish fisheries and issues of interest to the Council.

NMFS Northwest Fisheries Science Center will also briefly report on groundfish-related science and research activities.

Council Task:

Discussion.

Reference Materials:

1. Agenda Item F.1.a, Attachment 1: List of Groundfish and Pacific Halibut *Federal Register* Notices Published Since the March 2006 Council Meeting.
2. Agenda Item F.1.a, Attachment 2: Small Entity Compliance Guide: Pacific Coast Groundfish Fishery Sablefish Permit Stacking Program.
3. Agenda Item F.1.b, NWFSC Report: 2006 West Coast Groundfish Stock Assessment Workshops.

Agenda Order:

a. Regulatory Activities — Frank Lockhart
b. Science Center Activities — Elizabeth Clarke
c. Reports and Comments of Advisory Bodies
d. Public Comment
e. Council Discussion

PFMC
05/25/06

Agenda Item F.1.a
Attachment 1
June 2006

FEDERAL REGISTER NOTICES

Groundfish and Halibut Notices
March 15, 2006 through May 30, 2006

Documents available at NMFS Sustainable Fisheries Groundfish Web Site
http://www.nwr.noaa.gov/1sustfsh/gdfsh01.htm

71 FR 15045. Pacific Coast Groundfish Fishery; Specifications and Management Measures; Correction. Action: Final rule; correction. Revisions to the 2006 commercial and recreational measures for Groundfish taken in the U.S. EEZ - 3/27/06

71 FR 18227. Pacific Coast Groundfish Fishery; Specifications and Management Measures; Inseason Adjustments. NMFS announces changes to management measures in the recreational Pacific Coast Groundfish Fisheries - 4/11/06

71FR24601. Pacific Coast Groundfish Fishery; Specifications and Management Measures; Inseason Adjustments; Pacific Halibut Fisheries. Action: Inseason adjustments to groundfish management measures; announcement of incidental halibut retention allowance; request for comments - 4/26/06

71 FR 27408. Magnuson-Stevens Act Provisions; Fisheries off West Coast States; Pacific Coast Groundfish Fishery. NMFS is implementing the regulatory provisions of Amendment 19 to the Pacific Coast Groundfish Fishery Management Plan - 5/11/06

71 FR 29257. Pacific Coast Groundfish Fishery; Biennial Specifications and Management Measures; Correction. This final rule establishes the 2006 fishery specifications for Pacific Whiting in the U.S. Exclusive Economic Zone and state waters off the coasts of Washington, Oregon, and California - 5/22/06

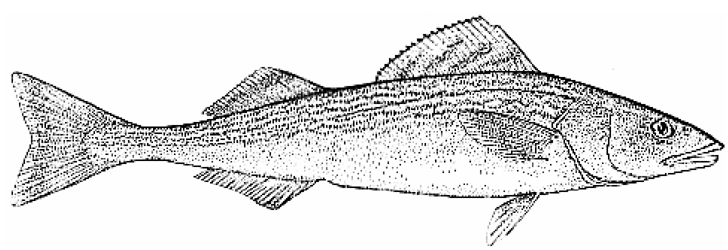
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northwest Region
Attn: Federal Permits Office
7600 Sand Point Way NE
Seattle, WA 98115
www.nwr.noaa.gov

SMALL ENTITY COMPLIANCE GUIDE

PACIFIC COAST GROUNDFISH FISHERY
SABLEFISH PERMIT STACKING PROGRAM

This guide is designed for fishermen participating in the limited entry fixed gear sablefish fishery during the primary season. It provides useful information that will assist fishermen in understanding regulations implementing additional requirements for the sablefish permit stacking program in waters off Washington, Oregon, and California from Amendment 14 to the Pacific Coast Groundfish Fishery Management Plan.

March 31, 2006



CONTENTS

This guide was prepared pursuant to section 212 of the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. 104-121. The statements in this document are intended solely as guidance. This document is intended to provide a plain-language summary of how small businesses can comply with the regulations further implementing the sablefish permit stacking program (71 FR 10614, March 2, 2006).

WHO SHOULD READ THIS GUIDE?

If you currently own a limited entry permit with a sablefish endorsement, are interested in purchasing or leasing a limited entry permit with a sablefish endorsement, and/or own or operate a vessel that participates in the limited entry, primary sablefish fishery – you should read this guide.

INTRODUCTION

Amendment 14 to the Pacific Coast Groundfish Fishery Management Plan (FMP) introduced a permit stacking program to the limited entry, fixed gear primary sablefish fishery off Washington, Oregon, and California. Under this permit stacking program, a vessel owner may register up to 3 sablefish-endorsed permits for use with their vessel to harvest each of the primary season sablefish cumulative limits associated with the stacked permits. Amendment 14 also provided for a fishing season up to 7 months long, from April 1 - October 31, which allows time for vessels to pursue their primary season limits.

Portions of Amendment 14 were implemented for the 2001 primary sablefish season. The extended sablefish season was fully implemented in 2002. In 2006, NMFS is implementing additional regulations for Amendment 14. In the future, NMFS will implement a permit stacking program fee system as required by the Magnuson-Stevens Fishery Conservation and Management Act.

Stages of Implementation

- Beginning in 2001, NMFS implemented the initial permit stacking provisions (66 FR 41152, August 7, 2001). The following provisions were put in place in 2001:
  (1) up to 3 sablefish-endorsed permits may be registered for use with a single vessel;
  (2) the limited entry, primary sablefish season is from August 15 - October 31, 2001;
  (3) a vessel may fish for sablefish during the primary season with any of the gears specified on at least one of the limited entry sablefish-endorsed permits registered for use with that vessel;
  (4) no person may own or hold[1] more than 3 sablefish-endorsed limited entry permits unless that person owned more than 3 permits as of November 1, 2000;
  (5) no partnership or corporation may own a sablefish-endorsed limited entry permit unless that partnership or corporation owned a permit as of November 1, 2000;
  (6) cumulative limits for species other than sablefish and for the sablefish daily trip limit fishery remain per vessel limits and are not affected by permit stacking; and
  (7) the limited entry daily trip limit fishery for sablefish is open during the primary season for vessels not participating in the primary season.

- Beginning in 2002, NMFS extended the fishing season to April 1 - October 31 as part of the Pacific Coast groundfish final specifications and management measures (67 FR 10490; March 7, 2002).

- Beginning in 2006, NMFS is implementing further permit stacking regulations that include the following provisions (71 FR 10614, March 2, 2006):
  (1) permit owners and permit holders are required to document their ownership interests in their permits to ensure that no person holds or has ownership interest in more than 3 permits;

[1] The permit holder is the vessel owner.

(2) an owner-on-board requirement for permit owners who did not own sablefish-endorsed permits as of November 1, 2000;
(3) an opportunity for permit owners to add a spouse as co-owner;
(4) vessels that do not meet minimum frozen sablefish historic landing requirements are not allowed to process sablefish at sea;
(5) permit transferors are required to certify sablefish landings during mid-season transfers; and,
(6) a definition of the term “base permit.”

This guide pertains to those provisions implemented beginning in 2006. Information on these provisions and compliance timelines are included under the chapters describing each provision.

Why is the date November 1, 2000, in the new regulations?

Throughout this compliance guide, you’ll notice reference to the date November 1, 2000. This date, also called the control date, was established to distinguish permit owners who participated in the sablefish fishery before that date from those that are newer to the fishery. The participants before that date are also referred to as “grandfathered” or “first generation” permit owners. Grandfathered or first generation limited entry sablefish-endorsed permit owners are those permit owners who owned a sablefish-endorsed limited entry permit prior to November 1, 2000. These first generation permit owners are exempt from certain requirements of the sablefish permit stacking program, such as the owner-on-board requirement. NMFS announced this November 1, 2000, control date in an Advance Notice of Proposed Rulemaking on April 3, 2001 (66 FR 17681).

1 Declaration of Permit Ownership Interest

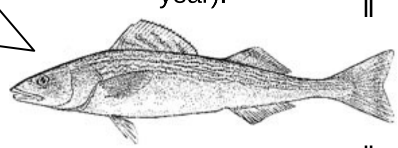
Background: Amendment 14 restricts the number of permits each person can have ownership interest in or hold to 3 permits, unless the person is grandfathered. This provision allows NMFS to track the number of permits owned and held by individuals.

Who must submit ownership interest information? All corporations or partnerships that currently own a sablefish-endorsed permit.

What are the ownership interest requirements?

- No partnership or corporation may own a sablefish-endorsed limited entry permit unless they owned a sablefish-endorsed permit as of November 1, 2000 (Partnerships or corporations that owned permits on or before that date, may continue to have ownership interest in those same permits and may purchase or hold additional permits up to the 3-permit limit; however, partnerships or corporations that owned a permit before November 1, 2000, and subsequently sell all of their sablefish-endorsed permits, will lose the privilege of continuing to own sablefish-endorsed permits if they do not buy another permit within one year).

Permit owners and permit holders are required to document their ownership interests in their permits to ensure that no person holds or has ownership interest in more than 3 permits.



- Any permit sold after November 1, 2000, may only be sold to an individual person or to partnerships or corporations that had ownership interest in a sablefish-endorsed permit before that date.

COMPLIANCE TIMELINE

Effective: **April 3, 2006**

Application Process:

- ✍ **In April 2006**, forms will be sent to corporations and partnerships that currently own or hold sablefish-endorsed permits. **The form will ask for a list of all shareholders or partners as of November 1, 2000, and a second listing of that same information as of the current date in 2006.** NMFS may require a copy of the USCG Abstract of Title as proof of vessel ownership for permit holders and/or owners and may require articles of incorporation or other documentation deemed necessary for proof of corporate or partnership ownership.
- ✍ **By July 1, 2006**, corporations or partnerships must return the completed form to NMFS.
- ✍ NMFS will send a second written notice to those entities who have not responded.
- ✍ **By August 1, 2006**, the completed form must be returned to NMFS. Otherwise, NMFS will void your existing permit(s) and reissue the permit(s) with a vessel registration given as "unidentified" until such time that the completed form is provided to NMFS.
- ✍ To track future changes, NMFS will send the form to corporations and partnerships as part of the annual permit renewal process and whenever a change in permit owner, permit holder, and/or vessel registration occurs.

- No individual person, partnership, or corporation in combination may own or hold more than 3 permits with sablefish endorsements either simultaneously or cumulatively over the primary season. The only exception to this requirement is if the person, partnership, or corporation had an ownership interest in more than 3 permits before November 1, 2000. An individual person, partnership, or corporation that had ownership interest in 3 or more permits with sablefish endorsements as of November 1, 2000, may not acquire additional permits beyond those particular permits owned on November 1, 2000. The term “cumulatively” means that an individual, corporation, or partnership may only be associated with up to 3 permits during the entire primary season.

- If, at some future time, an individual person, partnership, or corporation that owned more than 3 permits as of November 1, 2000, sells or otherwise permanently transfers (not holding through a lease arrangement) some of its originally owned permits, such that they then own fewer than 3 permits, they may acquire additional permits, but may not have ownership interest in or hold more than 3 permits.

- A partnership or corporation will lose their exemptions (the ability to own a sablefish permit and/or own more than 3 permits) when any “change” in the ownership of a corporation or partnership from that which existed on November 1, 2000, takes place. A “change” means the addition of any person (including family member) with an ownership interest in the corporation or partnership since November 1, 2000. A “change” is not considered to have occurred if an existing member of a corporation or partnership dies; becomes legally incapacitated; the ownership of shares among existing members changes; or a member leaves the corporation or partnership. Changes in the partnership or corporation must be reported to NMFS’ Sustainable Fisheries Division (SFD) within 15 calendar days of the addition of a new partner or shareholder.

What is the process to provide ownership interest information?

The process for declaring a permit’s ownership interest is described in the “compliance timeline” box on the previous page.

What will NMFS do with the ownership information?

- **Determine whether a partnership or corporation has changed**. If any of the corporations or partnerships have added one or more individuals as shareholder or partners since November 1, 2000, the corporation or partnership will no longer be able to own a permit. NMFS will void their existing permit, and reissue their permit in “unidentified” status, meaning that it cannot be fished. In order for the permit to be fished, the corporation or partnership will be required to permanently transfer the permit to another qualified individual, corporation, or partnership.

- **Recalculate the number of permits owned and/or held by each individual**. Those individuals who own or hold more than the allowable number of permits will be notified in writing. All permits owned or held by the individual will be registered as “unidentified” until such time that the individual divests themselves of the excess permits.

> **EXAMPLE:**
>
> **Do you own/hold more than 3 permits?**
>
> If a person is found to have ownership interest in 5 permits, 3 of which were owned as of November 1, 2000, NMFS will issue all 5 permits, including any permits shared with other individuals, partnerships, or corporations, into “unidentified” status until that person sells at least 2 of their permits so that they own or hold no more than 3 permits. If a person had ownership interest in 5 permits as of November 1, 2000, and still has ownership interest in those 5 permits and does not own or hold additional permits, none of the permits would be moved into the “unidentified” status.

How will the permit count be calculated?

NMFS counts as owning or holding a permit those individuals who are:

- listed as owner of a permit,
- listed as holder of a permit,
- listed as having an ownership interest in a permit as part of a corporation or partnership.

Each individual who is identified as owning or holding a permit as part of a corporation or partnership will be credited with owning one permit. If a person owns or holds other sablefish permits as an individual, those permits will also be figured in as part of the total count.

Is this a one-time collection of the information?

No. NMFS will require corporations or partnerships to complete this form:

- prior to July 1, 2006 (detailing the individuals with an ownership interest as of November 1, 2000 and as of the current date);
- as part of the annual renewal of their limited entry permit (starting in the Fall, 2006);
- everytime a partnership or corporation is part of a transfer request.

2 ADDITION OF A SPOUSE AS CO-OWNER ON A PERMIT

COMPLIANCE TIMELINE

Effective: **April 3, 2006**

Application Process:

- **In April 2006**, forms will be sent to permit owners with one individual listed as of November 1, 2000, to allow them to add their spouse on their permit. Applicants will be required to submit a copy of their marriage certificate as evidence of marriage.
- **By July 1, 2006**, the form must be returned to NMFS or the permit name on record with NMFS as of November 1, 2000, will remain on the permit.
- NMFS will not accept any declarations to add a spouse as co-owner after the deadline.

Background: Permit owners may not have predicted the implications of not listing their spouse under the detailed provisions of the permit stacking program. For example, if a couple was married as of November 1, 2000, but only one spouse was listed as the permit owner at that time, their spouse would not be exempt from the owner-on-board requirement should they inherit the permit (see Provision 3 below). However, for this one-time application, permit owners may add a not-listed spouse as a co-owner without losing their grandfathered status.

Who is eligible to make this change?
This provision applies only to permit owners who:
1) owned a sablefish-endorsed permit before November 1, 2000, and
2) who were married to their current spouse before November 1, 2000.
Existing partnerships and corporations may not add a spouse as co-owner.

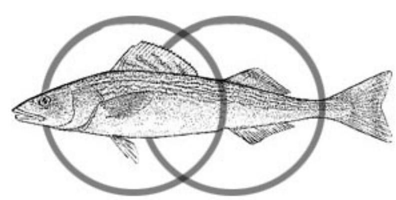
What is the requirement? Permit owners who were married as of November 1, 2000, and who owned a sablefish-endorsed permit as of that date, may wish to add their spouse as co-owner on their permit(s) and retroactively in NMFS' permit ownership records.

If I add my spouse as co-owner, will both of us be exempt from the owner-on-board requirement as individuals?
No. If you add your spouse as co-owner, your grandfathered status will be as a partnership, not as individuals. An individual within the married couple will not be able to retain their exemption from the owner-on-board requirement if they choose to buy another permit as an individual and did not own a permit as an individual as of November 1, 2000, in NMFS "corrected" records (i.e., NMFS records after allowing a not-listed spouse to be added as co-owner). The only way either person can have grandfathered status as an individual is if they continue to own a sablefish permit as an individual since November 1, 2000.

How will the permit count be calculated?
When a couple, married as of November 1, 2000, is listed as co-owners of the same permit, both individuals will be counted as owning one permit each.

Why you might want to do this-
To exempt your spouse from owner-on-board

Why you might NOT want to do this-
To maximize the permit count between you and your spouse



3 Owner-on-Board Requirement

Background: The sablefish permit stacking program is considered an individual fishing quota (IFQ) program. A concern about IFQ programs is that if fishing privileges are for sale, individuals or business entities who do not fish could buy those privileges. To encourage only fishers to buy into the sablefish fleet, Amendment 14 includes an "owner-on-board" provision.

COMPLIANCE TIMELINE

Effective: **January 1, 2007**

Application Process:

- All permit owners who are subject to the owner-on-board requirement will be notified in a letter from NMFS in 2006 and as part of the permit renewal process prior to the start of the primary sablefish season on April 1, 2007.
- Permits issued for the 2007 fishing season will designate which permits are subject to or exempt from the owner-on-board requirement.
- **In April 2006**, all individuals, partnerships or corporations who owned a permit as of November 1, 2000, and who no longer own a permit, will be notified in a letter from NMFS that they would qualify as a grandfathered permit owner if they choose to buy a permit by **March 2, 2007**.

Who is subject to the requirement?

An individual person who owns sablefish-endorsed permits currently but who did not have an ownership interest in a sablefish-endorsed permit as an individual as of November 1, 2000, will be required to be on board the vessel registered for use with that permit while that vessel is fishing for that permit's primary sablefish season limits. Persons subject to owner-on-board must carry government issued photo identification while onboard the vessel.

Who is exempt from the owner-on-board requirement?

A person, partnership, or corporation that had ownership interest in a limited entry permit with a sablefish endorsement prior to November 1, 2000, and continues to own a sablefish permit is considered grandfathered (or a first generation permit owner) and is exempt from the owner-on-board requirement. (See Examples on next page.)

There is also an emergency exemption that permit owners subject to the owner-on-board requirement may request in cases of death, illness, or injury of the permit owner. Please contact NMFS for details on how to apply for an emergency exemption.

Can an individual, corporation, or partnership lose their exemption?

Yes. A grandfathered entity will lose their exemption if:

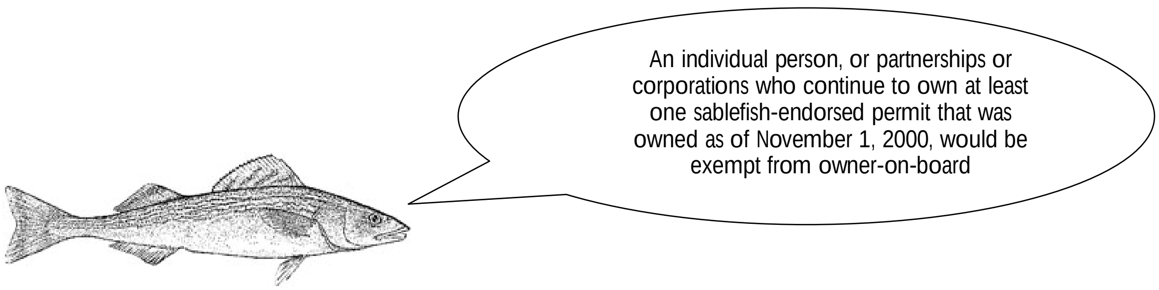
- A corporation or partnership "changes" (adds a partner or individual since November 1, 2000), or
- An individual, corporation, or partnership that owned a permit(s) as of November 1, 2000, sells all of their sablefish permits and does not purchase another permit within one year.

Is a permit holder subject to the owner-on-board requirement?

No. An individual person, partnership, or corporation may continue to hold sablefish-endorsed permits (e.g., through a lease arrangement) from any permit owner (exempt from owner-on-board or not) and remain exempt from the owner-on-board requirements, even if their membership has changed or they did not hold a sablefish-endorsed permit as of November 1, 2000. However, if you hold a sablefish-endorsed permit from a permit owner who is subject to the owner-on-board requirement, they must be onboard your vessel while that permit is being fished during the primary sablefish season.

Do I have to record my permit number on fish tickets?

Yes. Because only non-exempt permits owners are required to be onboard while their permit is being fished, enforcement agents must be able to determine which permits are being fished and which owner should be onboard. In order to aid enforcement of the owner-on-board provision, NMFS and the states are requiring the groundfish Federal limited entry sablefish-endorsed permit number to be written on state fish landing receipts (i.e., fish tickets) beginning in 2007.



EXAMPLES:

Grandfathered and selling all your permits?

If a person, partnership, or corporation that is exempt from the owner-on-board requirement no longer owns at least 1 sablefish-endorsed permit for a period greater than one year, that permit owner would no longer be exempt from the owner-on-board requirement. However, a person, partnership, or corporation that is exempt from the owner-on-board requirement could sell all of its permits, buy another sablefish-endorsed permit within one year of the date the last permit was approved for transfer, and retain its exemption from the owner-on-board requirements. In order to be allowed to obtain a permit during the one year grace period, the partnership or corporation could not have added or changed individuals, excluding individuals that have left the partnership or corporation or who have died.

Grandfathered in a corporation/partnership and buying another permit as an individual?

A person who has ownership interest in a partnership or corporation that owned a sablefish-endorsed permit as of November 1, 2000, but who did not individually own a sablefish-endorsed limited entry permit as of that date, is not exempt from the owner-on-board requirement when he/she leaves the partnership or corporation and purchases another permit individually.

Last remaining member of a grandfathered corporation/partnership?

A person who is part of a grandfathered partnership or corporation and did not own a permit as an individual before November 1, 2000 could buy additional permits as an individual, up to the limit of 3 per individual, but the individual would not be exempt from the owner-on-board requirements with the new permit. However, if the individual was part of a grandfathered partnership or corporation in which they were the only remaining individual (for example, all other individuals with ownership interest had left the partnership or corporation), this individual would still be considered as a grandfathered partnership or corporation in NMFS records. Thus, permits owned under the partnership or corporation now controlled by a single individual would be exempt from the owner-on-board requirements. This individually controlled partnership or corporation could also buy additional permits under the partnership or corporation name, up to the limit of 3 per individual, and would remain exempt from the owner-on-board requirements with the additional permits.

MORE EXAMPLES:

Do you qualify to be grandfathered but no longer own a permit?
A person, partnership, or corporation that qualified for the owner-on-board exemption, but later divested their interest in a permit or permits, may retain rights to an owner-on-board exemption as long as that person, partnership, or corporation purchases another permit by March 2, 2007. A partnership or corporation could only purchase a permit if it has not added or changed individuals since November 1, 2000, excluding individuals that have left the partnership or corporation or who have died.

Have you added members to your corporation/partnership since November 1, 2000?
If the individuals who have an ownership interest in the corporation or partnership change from those owning the partnership or corporation as of November 1, 2000, by adding another individual(s), that partnership or corporation will lose its exemption from both the owner-on-board requirement and from the provision that allows only an individual person to own a sablefish-endorsed permit.

> **Example A**, a husband and wife who own a permit could not add a sibling or child to the permit without losing their first generation status and losing their exemption from the provision that only allows an individual person to own permits.
> **Example B**, a fisherman who wants to take on a new partner because an existing partner is retiring could not add that new partner without losing his first generation status and his exemption from the provision that only allows an individual to own permits.
> **Example C**, in the case of a grandfathered corporation such as "Smith, Inc. and Jones, Inc.," viewed as one corporation in NMFS records, Jones, Inc. could not add a new member without causing "Smith, Inc. and Jones, Inc." to lose its grandfathered status.

Are you a married, grandfathered individual who would like to protect your spouse from owner-on-board?
If a couple was married as of November 1, 2000, but only one spouse was listed as the permit owner at that time, the spouse of the listed permit owner would not be exempt from the owner-on-board requirement if they inherit the permit. NMFS will allow an opportunity for those grandfathered permit owners who wish to add their spouses as co-owners on their permits to correct NMFS' permit ownership records as of November 1, 2000 (See Provision 2).

4 CERTIFICATION FOR MID-SEASON TRANSFERS

Background: With the longer sablefish primary season, there are more opportunities for permit owners to transfer their permits mid-season. Currently, when a sablefish permit is transferred mid-season, there is no indication by the transferor of how much sablefish has been landed against the tier amount for a particular permit. The mid-season certification is required for enforcement purposes as a way to associate specific amounts of landings to date with a total amount reported on fish tickets for a particular permit. The existing transfer form has been amended to include a section to provide this information.

Under already existing regulations, the transferee is required to retain onboard the vessel any fish tickets associated with landings made against that transferred permit, including any landings made previously on the permit during the primary sablefish season. Primary sablefish season fish tickets continue to be required onboard the vessel from April 1 – October 31 and for 15 days thereafter.

COMPLIANCE TIMELINE

Effective: **January 1, 2007**

Application Process:

- ✍ **Beginning January 1, 2007**, if a permit owner transfers a sablefish-endorsed permit mid-season, he/she will have to certify the cumulative amount of sablefish taken to date with that permit on a permit transfer form.
- ✍ The individual either leasing or buying the permit (the transferee) must acknowledge the cumulative amount of sablefish landed to date by signing the transfer form and maintaining the permit onboard the vessel.

Who is subject to this provision? This provision only applies to permit owners transferring their permits between vessels or between permit owners during the April-October primary season.

What is the requirement?
If a permit owner wishes to transfer a sablefish-endorsed permit mid-season, he/she will have to certify the cumulative amount of sablefish taken to date with that permit on a NMFS permit transfer form. In addition, the individual either leasing or buying the permit (the transferee) must acknowledge the cumulative amount of sablefish landed to date by signing the transfer form and maintaining the permit onboard the vessel. This certified amount should match the total amount of primary season sablefish landings reported on state fish tickets.

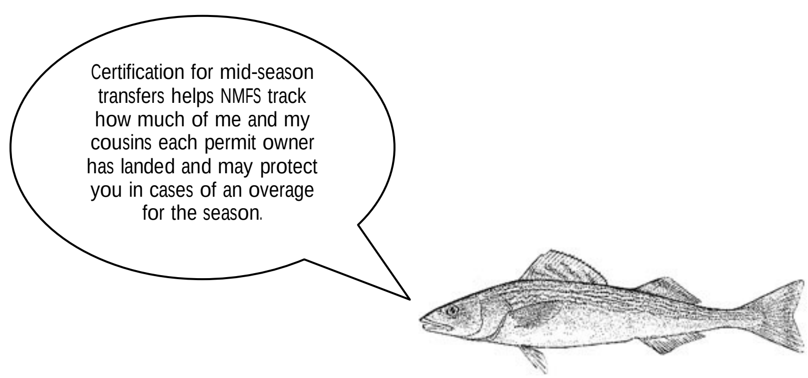
Does this certification occur with any type of transfer?
Yes, for transfers involving sablefish-endorsed permits during the primary season. Regardless of whether there is a change in the vessel registered to the permit and the permit owner/holder or just a change in the permit owner/holder, any of these actions will require a certification from the permit owner of the amount of sablefish landings to date.

How will enforcement use the information reported on a transfer form?
If during a post-season audit of landings associated with a sablefish-endorsed permit, the landings exceed the amount available to be landed on the permit, enforcement measures may be taken against any party that had ownership interest in the permit during the calendar year. The vessel owner or operator may also be held liable. It is a violation of both state and Federal law to give false or incomplete information on fish tickets.

Does the certification of sablefish landings impact other transfer requirements?
No. Permit transfers will still be constrained by limited entry program regulations, which allow a permit to be transferred between vessels only once per calendar year, and which make all permit transfers effective on the first day of a major cumulative limit period. Major cumulative limit periods will continue to begin on January 1, March 1, May 1, July 1, September 1 and November 1. While permits may only be transferred between vessels once per calendar year, changes in the permit owner or holder may occur at any time during the calendar year and as often as necessary.

How will NMFS be able to track the amount of sablefish on a permit?
In order to aid enforcement of mid-season transfers, NMFS and the states are requiring the groundfish Federal limited entry sablefish-endorsed permit number to be written on state fish landing receipts (i.e., fish tickets) beginning in 2007.

Why is the permit sale price and lease price requested?
In addition to the certification of sablefish landings to date, a space will be provided on the landings certification portion of the permit transfer form that requests the sale or lease price of the permit. Providing this sale or lease price to NMFS is optional. This information is being requested so that NMFS may build a database on permit sale prices. This database will be useful in analyzing economic trends and the value of the sablefish fishery.



5 PROHIBITION ON AT-SEA PROCESSING OF SABLEFISH

Background: The at-sea processing prohibition is to ensure that shoreside processing plants continue to have access to sablefish from the primary sablefish season. To acknowledge the investment that some vessels owners may have made in on-board freezing and processing equipment, the regulations allow a one-time opportunity to apply for an exemption from the prohibition on at-sea processing.

COMPLIANCE TIMELINE

Effective: **January 1, 2007**

Application Process:

- ✍ **In April 2006**, applications for an exemption to the prohibition on at-sea processing will be sent to sablefish-endorsed permit owners and/or fixed gear vessel owners.
- ✍ **By July 1, 2006**, permit and/or vessel owners must submit an application and supporting evidence to NMFS.
- ✍ NMFS has 30 days to review the application and make a decision.
- ✍ Those who qualify will be issued a letter from NMFS to carry onboard their vessel.
- ✍ There is an appeals process if you disagree with NMFS determination. For more details on the appeals process, please contact NMFS.

Who is eligible to apply for the exemption?

Any vessel owner that currently owns a sablefish-endorsed permit and whose vessel processed frozen sablefish in any one year from 1998 to 2000.

What is the general requirement?

Beginning January 1, 2007, vessels will be prohibited from processing sablefish at sea that were caught in the primary season, unless the vessel has an exemption from this prohibition.

What is the definition of processing?

"Processing" is defined as, "the preparation or packaging of groundfish to render it suitable for human consumption, retail sale, industrial uses or long-term storage, including, but not limited to, cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, but does not mean heading and gutting unless additional preparation is done."

What are the qualifying criteria for an exemption?

The vessel must have:

- processed at least 2,000 pounds (round weight) of frozen sablefish in any one year during 1998, 1999 or 2000. Processing in 2000 would have to have occurred before November 1, 2000.
- The vessel must currently have a sablefish-endorsed permit.
- The vessel owner must have had a valid sablefish-endorsed permit at the time the qualifying fish were landed.

- The sablefish must have been caught during the primary season in waters 0-200 miles off Washington, Oregon and California.

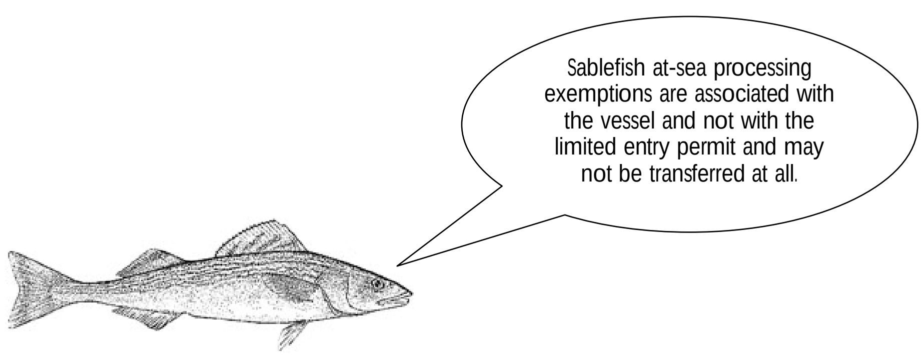
Do I need to prove that the vessel actually processed sablefish?
Yes. An applicant must provide documentation (i.e., sales agreements, bills of lading) that demonstrates the amount of frozen sablefish produced during the qualifying years. The best evidence of a vessel having made frozen sablefish landings are state fish tickets for landed sablefish accompanied by receipts for frozen sablefish from fish buyers or exporters. Evidence of having purchased freezing equipment will not in itself serve to support an application.

How will I know if my application is approved?
NMFS will send a letter to the vessel owner indicating whether your application was approved or disapproved. NMFS will also publish a list of vessels that qualified for the exemption in the Federal Register.

Is the exemption part of the sablefish permit?
No. The exemption, if approved, will be granted through a letter from NMFS and must be carried on the vessel during the primary season. This exemption would apply only to the vessel while the vessel is registered for use with a sablefish-endorsed limited entry permit. The exemption would not be associated with any of the permits registered for use with the vessel and would not be transferable to any other vessel, including other vessels belonging to that same permit and/or vessel owner.

Is the at-sea processing vessel exemption transferable? No.

When does the exemption expire?
When the vessel is totally lost or the vessel is sold or is otherwise transferred to another owner.



6 DESIGNATION OF A BASE PERMIT

The base permit is the limited entry permit registered for use with a vessel that meets the permit length (size) endorsement requirements appropriate to that vessel. A limited entry permit endorsed for pot or longline gear (i.e., any gear other than trawl gear) may be registered for use with a vessel up to 5 ft longer than, the same length as, or any length shorter than, the size endorsed on the existing permit without requiring a combination of permits or a change in the size endorsement. The Groundfish FMP describes a base permit in a permit stacking program as the initial permit needed to participate in the limited entry fishery, and subject to all of the requirements for limited entry permit ownership qualifications, and permit gear and length endorsements.

The permit registered for use with a vessel that is appropriate to that vessel's length is considered the base permit. The process for designating the base permit is described in the "compliance timeline" box at right. Each vessel must be registered for use with at least one permit with a length endorsement appropriate to that vessel. Any additional stacked sablefish-endorsed permits do not need to match the vessel's length.

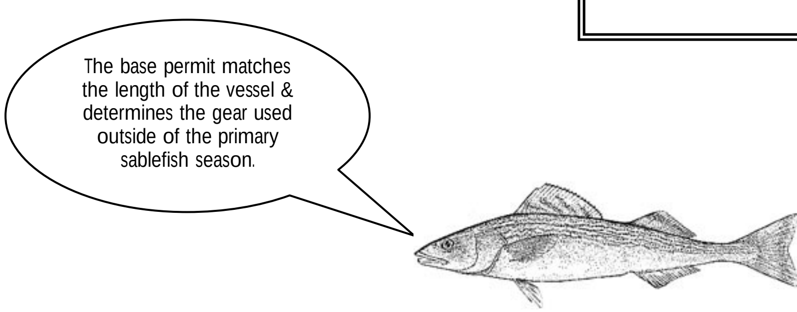
Outside of the primary season, the vessel would operate under the per vessel cumulative limit restrictions appropriate to the gear of the base permit.

COMPLIANCE TIMELINE

Effective: **January 1, 2007**

Application Process:

- **Fall 2006**, with the limited entry permit renewal process, if more than one permit registered for use with a vessel has an appropriate length endorsement for that vessel, NMFS will designate a base permit by selecting the permit that has been registered to the vessel for the longest time. This designation will appear on the renewed permit.
- If the permit owner objects to NMFS's selection of the base permit, the permit owner may send a letter to NMFS requesting the change and the reasons for the request. If the permit requested to be changed to the base permit is appropriate for the length of the vessel, NMFS will reissue the permit with the new base permit.



NEED HELP?

Websites

National Marine Fisheries Service, Northwest Region,
Pacific Coast Groundfish Management
www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/index.cfm

Forms/Applications available online at the Federal Permits Office website:
www.nwr.noaa.gov/Groundfish-Halibut/Fisheries-Permits/index.cfm

Addresses & Phone Numbers

Permit questions or mailings? Contact the Fisheries Permit Office

National Marine Fisheries Service
Northwest Region, Sustainable Fisheries Division
Attn: Fisheries Permit Office
7600 Sand Point Way NE, Bldg. #1
Seattle, WA 98115-0070

Phone: 206-526-4353
Fax: 206-526-6736

Regulation questions? Contact the Groundfish Policy and Regulations Branch

Phone: 206-526-6140
Fax: 206-526-6736

ATTACHMENT A: GLOSSARY

Base permit, with respect to a limited entry permit stacking program, means a limited entry permit registered for use with a vessel that meets the permit length endorsement requirements appropriate to that vessel.

Change in partnership or corporation means the addition of a new shareholder or partner to the corporate or partnership membership. This definition of a “change” will apply to any person added to the corporate or partnership membership since November 1, 2000, including any family member of an existing shareholder or partner. A change in membership is not considered to have occurred if a member dies or becomes legally incapacitated and a trustee is appointed to act on his behalf, nor if the ownership of shares among existing members changes, nor if a member leaves the corporation or partnership and is not replaced. Changes in the ownership of publicly held stock will not be deemed changes in ownership of the corporation.

Corporation is a legal, business entity, including incorporated (INC) and limited liability corporations (LLC).

Grandfathered or first generation, when referring to a limited entry sablefish-endorsed permit owner, means those permit owners who owned a sablefish-endorsed limited entry permit prior to 11/1/ 2000, and are, therefore, exempt from certain requirements of the sablefish permit stacking program within the parameters of the regulations.

Hold, with respect to a permit holder, means a vessel owner as identified on the United States Coast Guard (USCG) form 1270 or state motor vehicle licensing document.

Partnership is two or more individuals, partnerships, or corporations, or combinations thereof, who have ownership interest in a permit, including married couples and legally recognized trusts and partnerships, such as limited partnerships (LP), general partnerships (GP), and limited liability partnerships (LLP).

Permit holder means a vessel owner as identified on the United States Coast Guard (USCG) form 1270 or state motor vehicle licensing document.

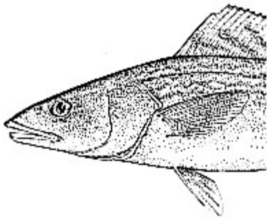
Regional Administrator means the Director, Northwest Region, NMFS.

Sustainable Fisheries Division (SFD) means the Chief, Sustainable Fisheries Division, Northwest Regional Office, NMFS, or a designee.

Spouse means a person who is legally married to another person as recognized by state law (i.e., one’s wife or husband).

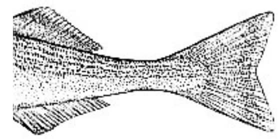
Stacking is the practice of registering more than one limited entry permit for use with a single vessel.

ATTACHMENT B:
SUMMARY SHEET OF PROVISIONS AND EFFECTIVE DATES



ATTENTION: Primary Season Sablefish Fishermen

Additional Sablefish Permit Stacking Regulations
(aka: Amendment 14b)



The final rule implementing additional provisions for the sablefish permit stacking program published in the *Federal Register* on March 2, 2006 (71 FR 10614), and will be effective beginning April 3, 2006. Below is a list of provisions implemented through this rulemaking, along with general effective dates.

Provisions implemented through Amendment 14b

1. declaration of permit ownership interest
2. addition of a spouse as co-owner on a permit
3. owner-on-board (OOB) requirement
4. certification for mid-season transfers
5. prohibition on at-sea processing of sablefish
6. designation of a base permit

Effective April 2006:

- Ownership interest form must be filled out for all permit transfers
- NMFS will send a compliance guide to the fleet about these provisions.
- NMFS will also send letters, forms, & applications to the fleet on:
  - addition of a spouse as co-owner on a permit
  - ownership interest in permit as of 11/1/2000 and as of the current date
  - exemption from the at-sea processing prohibition
  - notification for those permit owners who will be subject to OOB

Effective January 2007:

- Permit owners must be onboard the vessel when that vessel is fishing for sablefish in the primary season against that permit's tier, unless the permit owner is grandfathered (i.e., exempt from OOB).
- During mid-season transfers, the transferor must certify the quantity of sablefish landed on the permit and the transferee must acknowledge the amount of landings to date.
- At-sea processing of sablefish will be prohibited, unless the vessel and permit owner have previously qualified for an exemption.
- A base permit will be designated among the stacked permits with the permit renewal process in the fall of 2006.
- WA, OR and CA will require the sablefish-endorsed permit number to be written on the fish ticket.

Effective April 2007:

- Previously grandfathered permit owners (i.e., exempt from OOB) who no longer qualified as grandfathered upon publication of the final rule and have not gotten back to their original grandfathered configuration, will no longer be exempt from OOB.

NMFS NWR
3/2006

PFMC meeting
Seattle, WA

Agenda Item F.1.a
Supplemental NMFS Report
June 2006

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic Atmospheric Administration
National Marine Fisheries Service
Sustainable Fisheries Division
7600 Sand Point Way N. E., Building. 1, Bin C15700
Seattle, WA 98115-0070

DATE: June 9, 2006
TO: DISTRIBUTION
FROM: F/NWR2 -Becky Renko
SUBJECT: PRELIMINARY Report #3 -- 2006 Pacific Whiting Fishery

This report consolidates preliminary state, federal, and tribal data for the 2006 Pacific whiting fishery. Due to concerns about the incidental catch of overfished species, bycatch limits are in place for canary (4.7 mt) and widow rockfish (200 mt) taken in the non-tribal sectors of the fishery. If either bycatch limit is reached, the primary whiting seasons for the non-tribal fisheries will end regardless of the amount of whiting allocation remaining.

	Allocation		Whiting Catch* (mt)	Overfished Species and Chinook salmon catch	Thru [date]	Status	Percent of alloca-tion taken
	Percentages	Metric Tons					
California (south of 42 N lat.)	(5% shore alloc'n; included in WOC shore allocation)	4,873	5,241		5/25	started 4/1, closed 1800 5/25	107.5%
Oregon	--	NA	0				
Washington	--	NA	0				
WOC shore-based	42% commercial OY	**97,469**	5,241	Canary - 0.00 mt Widow -3.38 mt Darkblotched - 2.12 mt Chinook # 210	--	starts 6/15	5.3%
Mothership (n. of 42 N. lat.)	24% commercial OY	**55,696**	35,896	Canary - 0.55 mt Widow - 64.47 mt Darkblotched - 3.94 mt Chinook # 546	6/8	started 5/15	64.4%
Catcher/ processor (n. of 42 N. lat.)	34% commercial OY	**78,903**	23,207	Canary - 0.07 mt Widow - 27.80 mt Darkblotched - 0.91 mt Chinook - #108	6/8	started 5/15	29.4%
Total nontribal	commercial OY	232,069	64,344	Canary - 0.62 mt Widow - 95.65 mt Darkblotched - 6.97 mt Chinook - # 864	--	--	27.7%
Tribal (Makah)		**35,000**	175	Canary - 0. 00 mt Widow - 0.00 mt Darkblotched - 0.00 mt Chinook - #173			0.5%
Total directed fishing		267,069	64,519	Canary - 0.62 mt Widow - 95.65 mt Darkblotched - 6.97 -mt Chinook - # 1,037	--		24.1%

* Catch includes: discards from at-sea processors; weigh-backs from shore-based vessels; and catch landed under trip limits prior to the season. The values for at-sea processing sectors are based on NMFS observer data. Data for shore-based vessels were provided by the States. Data for the at-sea processing portion of the Makah fishery are based on preliminary NMFS observers data and shore-based catch was provided by tribal samplers. All weights are in metric ton (2,204.6 pounds).

Agenda Item F.1.b
NWFSC Report
June 2006

2006 WEST COAST GROUNDFISH STOCK ASSESSMENT WORKSHOPS

Three workshops will be hosted by the NW Fisheries Center (NWFSC) during this off-year assessment cycle. The workshops include: 1) The Data and Modeling Workshop, 2) The Pre-recruit Survey Workshop co-hosted with the Southwest Fisheries Science Center, and 3) The NWFSC Bottom Trawl Survey Workshop. These workshops have been identified as being critical in support of the upcoming 2007 assessments.

The Data and Modeling workshop will be held August 8-10 in Seattle, Washington. The workshop will address a number of topics relating to the treatment of data in assessments and other modeling issues, including a review of the features and functionality of the SS2 modeling platform. Additional topics that are likely to be covered in this workshop include:

- A general review of available data sources for west coast groundfish (detailed reviews of data to be used in individual stock assessments are envisioned to occur during pre-assessment workshops in early 2007);
- Standardized methods for constructing age and length compositions and ageing-error matrices, and the treatment of sample-size issues;
- Dealing with uncertainty in parameter values (use of priors).

Organized in cooperation with the SW Fisheries Science Center (SWFSC), the Pre-recruit Survey workshop will be held September 13-15 in Santa Cruz, California to address issues relating to young-of-the-year groundfish surveys. The workshop will focus on:

- Review and finalization of protocols for an integrated, coastwide pre-recruit survey, to be conducted by the SWFSC and the NWFSC, in cooperation with the Pacific Whiting Conservation Cooperative;
- Evaluation of methods for including existing pre-recruit survey data in groundfish stock assessments, based on several case studies;
- Evaluation of the usefulness of pre-recruit abundance indices in assessing the status of groundfish stocks.

The NWFSC Bottom Trawl Survey workshop will be held October 31-November 2 in Seattle, Washington. The workshop will address the integration of the NWFSC shelf-slope survey into groundfish assessments. The major topics to be covered in this workshop include:

- Review of data collected by the NWFSC survey;
- Discussion of methods for developing biomass estimates and summaries of biological data;
- Comparison of survey selectivity and catchability between the NWFSC and Alaska Fisheries Center (AFSC) triennial surveys, for a set of shelf species;
- Comparison of results from including these surveys as separate or continuous time series, for the same set of shelf species.

The three workshops are open to the public. For more information on the workshops or the 2007 west coast groundfish stock assessments, please contact Ms. Stacey Miller, Northwest Fisheries Science Center Stock Assessment Coordinator, at (206) 860-3480 or by email at Stacey.Miller@noaa.gov.

SUMMARY OF WEST COAST GROUNDFISH OBSERVER PROGRAM DATA COLLECTION AND QUALITY CONTROL PROCESS NORTHWEST FISHERIES SCIENCE CENTER

Summary

The Northwest Fisheries Science Center's West Coast Groundfish Observer Program regularly provides the Pacific Fishery Management Council with discard and bycatch rate information. The rates are determined from data collected by at-sea observers deployed on commercial fishing vessels operating in west coast fisheries catch and retain groundfish. Before use, observer data passes through four phases, which take a total of three and a half to four months. This document details these processes, their timelines and suggests possibilities for reducing the amount of time required to complete them and summarizes difficulties in moving toward in-season catch accounting.

The first phase, data collection, entry and initial quality control, takes two months from the collection of the last observed trip of a period. This time could be reduced somewhat if fewer observers were deployed and instead resources were used for staff to quality control data. Since this would reduce existing coverage levels of groundfish fisheries this is not considered an option

The second phase, identifying and attaching corresponding fish ticket with observer data, takes about 10 weeks from the last observed trip of a period. Currently, the program waits two months after the last observed trip of a period for ~90% fish ticket completion rate in the PacFIN system to begin locating and attaching fish ticket and observer data. The time required for this phase could be shortened if fish ticket data were available more rapidly.

The third phase, data processing and analysis, takes about four weeks for each fishery for which discard and bycatch rates are produced. The time needed to complete this phase could be reduced if the fish ticket data set was entirely complete in PacFIN data system sooner, each landing could be easily attributed to a specific fishery, and there were greater consistency in recording catch categories in fish ticket and logbook records. Production of reports that focus solely on summarizing new data, rather than also evaluating changes from previous reports, would also expedite this phase.

Within the fourth phase, final preparation of the data and updating of projection models for use in management, takes about two weeks for the trawl fleet and an additional week for each of the other fleets. Estimation of total discard mortality for each fleet during the previous year requires an additional two weeks for the trawl fleet and another week for each of the other fleets.

In summary, the principal objective of the observer program is the documentation of discards and is not to duplicate the other existing data systems that estimate the catch that is retained. Accordingly, observer data represent only a portion of the information required to estimate total fishing mortality. Discard information must be combined with data from other sources such as fish tickets and vessel logbooks (where available), in order to document total catch. While some internal steps can be taken to reduce the data turnaround time in releasing observer data, because

of its connection with other data sets, other programs and agencies must also take steps in order to reduce the turnaround time.

There are many issues that complicate the potential for processing observer data on a more real-time basis and using those data for in-season management of fleet or vessel total catch caps. In addition to the availability of auxiliary data, substantial concerns about how data would be applied to unobserved vessels would need to be addressed. Existing methods for pooling observer data to protect confidentiality and achieve reasonable sample sizes would not function well in real-time mode, given existing levels of observer coverage. Changes in the sampling design used to distribute observer coverage might improve the extent to which all fleet fishing strategies are observed within any particular 2-month period. However, further analysis is required in order to evaluate the degree to which gaps in coverage would create problems for reporting and applying rates from observed to unobserved vessels over short time periods throughout the year.

Overview

The Pacific Fishery Management Council manages the fisheries off the coasts of California, Oregon and Washington. To aid in Council decisions, the Northwest Fisheries Science Center (NWFSC) provides fisheries research and data on species populations, bycatch rates and economic impacts. The West Coast Groundfish Observer Program (WCGOP) is responsible for collecting the main source of groundfish bycatch data provided to Council. This document describes how the bycatch data is produced for management use. The multifaceted process and the steps involved in final production of data are described and suggestions are made on actions that could be taken to reduce the time to produce the final bycatch and discard information.

The WCGOP deploys trained fishery observers in the limited entry bottom trawl, limited entry fixed gear and the 'open access' fleets (which currently includes the California sablefish open access fleet, Oregon and California near-shore fleets and a portion of the California halibut trawl fishery). Observers' primary responsibility is to monitor the composition and volume of discarded catch on each tow/set. The program randomly selects portions of each fleet for coverage based on geographical area, fishery, vessel activity, and the availability of observer resources.

Vessels participating in the limited entry trawl, limited entry zero tier fixed gear, near-shore and/or California halibut fisheries are selected for observer coverage for all trips taken during a two-month trip limit period. As the limited entry fleets land the majority of groundfish, they are a higher priority and typically all limited entry trawl and zero tier fixed gear trips are observed during their selected period. Coverage of the near-shore and California halibut fisheries are given at this time a lower priority, therefore observers cover these vessels only if a limited entry vessel is not active. Vessels participating in the limited entry sablefish endorsed fishery are selected for all trips during the sablefish season where the vessel lands sablefish against a tiered quota. Typically, all trips with sablefish tiered landings are observed.

The following section highlights the major steps or phases the data goes through before it is submitted for use by the Council. Figures 1 and 2 provide a visual illustration of these phases as well. Figure 3 provides an example timeline of the entire process for one fishery.

Phase 1 - Data Collection, Entry and Initial Quality Control

Observers collect fishing effort information, estimate total catch weight, estimate discard weight, and take species composition and biological samples from the discard (sampling details are available from the WCGOP Observer Training Manual at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/index.cfm). This information is recorded on waterproof deck forms and upon completion of a trip; the observer enters the data into the observer database. Once an entire trip is entered, the observer runs a data integrity check program consisting of approximately 170 data error checks. At the end of each month, the observer sends the hardcopies of their data to their debriefer. The debriefer, a staff member, then reviews sampling methods and checks for any calculation or data form errors. The data is returned to the observer who corrects errors on the hardcopies and in the database. After a two-month period is completed and a debriefer has checked all data, the observer is interviewed. During the interview, a last check is done for any more data or sampling method errors, species identifications are verified, all biological samples are logged and verified, and the observer's performance is evaluated. After the interview, the debriefer evaluates the data quality, either passing or failing a trip or a segment of trip based upon standard evaluation criteria. The debriefer performs a final verification to confirm that the hard copies of the data match the data in the computer. Finally, the debriefer runs a data error check for the data set, updates any errors found, and closes the trip to prevent further updates.

Time needed:
It typically requires two-months from the end of the data collection period to complete this phase.

Suggestions for reducing the time needed for phase 1:
Currently, the observer program does not release any preliminary data. As the data is from a sub-sample of the fishery, the program must ensure the highest data quality. Accelerating the schedule may impact data quality and the ability to maximize sea time as observers may have to forego trips for debriefing.

Phase 2: Identify and Attach Corresponding Fish Ticket Data with Observer Data

Once phase one is completed, the database manager runs a final quality control check on the entire data set to be analyzed. The quality control can be done by fishery or as a combination of all data collected from all fisheries during a given time period. A debriefer reviews all data that was flagged from the data error check and makes updates when necessary.

After the quality control, the observer data is matched with fish tickets (downloaded from PacFIN) on a per trip basis. To estimate total catch on observed vessels and to relate the data to the unobserved portion of the fleet, observer data and fish ticket(s) data are matched (i.e. the fish ticket(s) data produced for every observed trip is collected from PacFIN). Although locating fish tickets for all observed trips seems a relatively straightforward process, it is not. The state agencies are responsible for delivering the fish ticket information to PacFIN and there is a delay between fish ticket production at the time of landing and when that information is available for observer program use in PacFIN. Currently, it takes approximately two months to have a 90% fish ticket completion rate.

To aid in identifying the correct ticket data, observers record fish tickets number(s) for all trips observed. Using this information, most observed trips can be easily matched with the correct fish tickets. However, observers often only have one fish ticket number from trips that had multiple fish tickets generated as additional fish tickets can be created due to weighbacks, etc.

The database manager searches through the fish ticket list by vessel and using the landing date recorded by the observer, ensures that all fish tickets generated from a trip are located. Cancelled tickets are another complicating factor. For example, there are some ports where a fish ticket is generated at the dock but then the fish are taken by van to a processing facility or market. It appears that sometimes when the transportation of fish occurs, the processor completes a second fish ticket, making the first fish ticket obsolete. Finding the correct tickets can be especially difficult, as there are many days in between vessel landing and the fish ticket being generated. The database manager has created a query to make this process more efficient, however it still takes two weeks to complete this second phase and phase two can not begin until at least a significant portion of the fish tickets from the trip limit periods of the data set are available in PacFIN. Currently, the observer program waits for ~90% fish ticket completion rate or about two months.

Time needed:
Two months and two weeks.

Suggestions for reducing time needed for phase 2:
If the time to submit tickets were reduced, then the time needed to accomplish this phase would also be reduced. Electronic fish tickets are being investigated by at least one state as a viable option to decrease upload time to the PacFIN data system.

Phase 3: Data Processing and Analysis

After the data have gone through quality control, error checking and all fish tickets are located for observed trips, the data are processed by the analyst and then used to estimate discard rates. As fish ticket data are collected on a trip basis and observer data are collected on a set/haul basis, the data sets must be processed to relate to each other.

First, the analyst estimates haul-level weights of species or species groups. As the observer often subsamples hauls/sets, the analyst uses the weights of the species in the each subsample to estimate the weight of the species in the haul/set. For details on methodology, please see the observer data reports available online at:
http://www.nwfsc.noaa.gov/research/divisions/fram/observer/index.cfm).

As previously mentioned, the observer data set and the fish ticket data set use different coding and have different levels of detail. Before the data sets can be joined, the analyst must assign consistent species, catch categories, port and port group coding to the two datasets.

Once the two data sets have consistent coding, the next step is to match catch categories on the fish tickets to retained catch categories in the observer data. The catch categories are species or species groups. The first part of this step involves calculating the trip-level weights of retained for each catch category for both observer data and fish ticket data. The fish ticket and observer data are then matched by catch category and trip. Next the two datasets are joined and the values from the observer data and fish ticket data are compared. At this point, discrepancies between the observer data and the fish ticket data will become obvious.

The analyst works to identify and resolve gross discrepancies between the observer data and the fish ticket data, such as extreme differences in total retained catch and missing fish tickets. The data are also examined for extreme differences in the weight of the landed catch between fish ticket and observer data. Another issue is that catch categories will appear in only one of the datasets; this discrepancy often occurs when catch categories are combined (i.e. other flatfish) in one dataset and specified in the other dataset (i.e. other flatfish vs. butter sole, sand sole, and curlfin sole). For each one of these discrepancies, an attempt is made to determine the cause of the discrepancy to resolve it.

For the gross discrepancies, the analyst attempts to determine the cause. Investigating the discrepancies may involve searching for additional fish tickets for a trip and looking at comments by haul in the observer data. Finally, decisions are made on the course of action for each discrepancy that does not have a clear cause. This matching process is very labor intensive and time consuming, as each discrepancy must be handled individually.

After the causes of the discrepancies are corrected, the two datasets are then joined again. Another check for discrepancies is repeated and if necessary a third or fourth check is conducted.

Once the observer data and fish ticket data are satisfactorily joined by category and trip, the weight of the observer retained catch is adjusted so that the total weight by trip for each catch category in the observer data matches the weights in the fish ticket data. Also for the catch categories only in the fish ticket data, the weight of the catch category landed in each haul/set is estimated. At this point, the data are ready to be analyzed.

For the observer program data reports, the analyst estimates coverage, total discarded catch for observed trips, and discard and bycatch rates for observed trips. To calculate the coverage of a fishery by weight, the total landings made by the fishery are determined by adding together fish ticket weights associated with the fishery. The PacFIN system is queried for this data, but determining total landings for each fishery can be problematic, as the fish ticket does not identify the fishery in which a vessel was participating. Associating landings with limited entry trips is not too problematic for the limited entry fleets as these vessels fish almost exclusively in only one of the limited entry fisheries. In contrast, the open access fishers often participate in many different fisheries, sometimes in the same trip. For the open access fisheries, the program has yet to identify a method to estimate total cumulative landing by fishery. WCGOP is currently working with the states to attempt to estimate the landings by fishery. The inability to estimate total landings for a fishery results in the program being unable to estimate the percent coverage by weight or determine how well observer data matches normal fleet spatial and temporal activity. Also, discard and bycatch rates can be determined for observed trips but any extrapolation to a fishery as a whole can be challenging and utilize multiple assumptions.

For the most part, estimating total discarded catch and discard and bycatch rates of observed trips for each species/species complex is relatively straightforward. Total discard for over 30 species is determined for multiple strata (see Table 4 from observer program trawl report, Sept 2005 at: http://www.nwfsc.noaa.gov/research/divisions/fram/observer/datareport/trawl/datareportsep2005.cfm) by using a ratio estimator to relate the discard and bycatch to hours of towing and/or total retained catch. However, the process is lengthy due to the sheer number of species and strata. A report typically contains 60-80 tables.

Finally, the data and tables are summarized and the reports are written. Due to the fishery-specific differences, the data processing, analysis and writing has to be done separately. Currently four, fishery-specific reports are produced by the observer program.

Time needed:
Four weeks per fishery.

Suggestions for reducing time needed for phase 3:
A complete set of fish tickets would eliminate the need for the analyst to search for missing tickets. A mechanism to denote on a fish ticket which fishery each fish is being landed in would make it easier to determine total landings in a fishery. In particular an identifier added to fish tickets and logbooks to identify when EFP fishing was occurring would be helpful because bycatch rates observed in the general fishery should not be applied to fishing experimental fishing where either retention is required or discards are documented separately. There should be consistency in recording catch category labels on fish tickets between states/processors. This would help data turnaround since the larger the number of differences on how a species is recorded on a fish ticket, the more discrepancies during the matching process that the analyst must investigate.

Phase 4: Development and delivery of discard data and modeling for use in management

Observer data are used in management in two ways: for estimating past amounts of fleet discard, and for projecting discard and bycatch amounts expected in future periods.

For the groundfish trawl fleet, discard in the previous year is estimated using vessel-level data from fish tickets and logbooks, along with observer data from that year. Logbook and observer data are stratified by depth, area, and season. The amount and distribution of fleet effort, obtained from logbook data, is combined with observed discard rates to estimate overall amounts of discard for trips included in logbook records. Because logbooks do not capture 100% of groundfish trawl trips, ratios of fish ticket-to-logbook retained catches are used to expand the discard estimates to the entire trawl fleet. Since non-trawl fisheries lack comparable logbook programs, estimation of past discard relies primarily upon observer and fish-ticket data. Observer data have been incorporated in a depth-specific manner in the sablefish fishery, based on closed-area boundaries, and in the near-shore fisheries, based on state estimates of the distribution of fishing effort. Computation of the best estimates of past discard requires that all of these components be available before the analyses can be conducted.

It must be stressed that discard estimates from WCGOP-observed fisheries represent only a portion of the information needed to estimate total fishing mortality. Fish tickets are needed to document retained groundfish catch in commercial and tribal fisheries. Data from recreational fisheries are needed to document both retained catch and discard mortality in those fisheries. Additionally, estimates of groundfish discard mortality from unobserved fisheries must also be accounted for. Estimates of mortality from this last category, as well as catches attributable to research fishing and exempted fishing permits are typically compiled by the GMT.

The Council is most commonly presented with <u>projections</u> of total catch and discard, as part of GMT evaluation of alternative management measures. The model employed by the GMT (and developed by the NWFSC) to project total catch for the trawl fleet uses 4-year, weighted averages of fish-ticket, logbook, and observer data, where the most recent data are assigned the greatest weight. The data are stratified into depth zones and areas that are consistent with regional and closed-area options commonly considered for Council management action. Projection models for fixed-gear sablefish and near-shore fisheries utilize expected regional landed catches of target species in those fisheries (based on OY allocations or other harvest targets) and prior observer data.

Current time requirements for preparing updated data for projection models:
2 weeks for trawl; 1 week each for other observed fleets.

Current time requirements for developing estimates of the previous year's discard:
2 weeks for trawl; 1 week each for other observed fleets.

Impediments to in-season catch accounting and suggested next steps to be taken by WCGOP to improve data turn around.

Moving towards a more real-time accounting of total catch, whether at the fleet or vessel level, is complicated by a number of issues. With the existing level of observer coverage, discard data are currently pooled across depths, seasons, and large areas in order to ensure that discard rates applied to unobserved vessels are based on reasonable sample sizes. Because the distribution of observers is achieved through a stratified random sample based on only on gear, port group, and 2-month period, and the actual distribution of fishing effort is uncertain, there is no guarantee that observed vessels will fish within specific depth zones or shorter time intervals in which unobserved vessels fish. To protect the confidentiality of observed vessels, current national policy does not even permit discard rates to be reported for strata in which fewer than 3 vessels have been observed. The current schedule for evaluating fleet discard permits observer data to be stratified in a manner that accounts for reporting and statistical criteria after the actual temporal and spatial distribution of observed fishing effort during a year is known.

Applying observed data to the unobserved fleet on an ongoing basis throughout the year, for the most recent week, month, or even 2-month period, would not permit this sort of data-pooling. Aggregating observer data on a coast-wide basis, or across all depths, in order to achieve adequate sample sizes is not an acceptable option, as existing data clearly indicate vastly different rates of encounters and discard for most species across these dimensions. Over some duration of time—likely at least 2 months—gaps in observer data could be reduced, through additional stratification of observer sampling effort, in order to increase the likelihood of collecting data from the full cross-section of fishing activities in which the fleet is likely to engage during that period. But such an effort would need to be based either on prior vessel participation or on an advance declaration process. Neither option would carry a guarantee that an adequate number of observations would be made within a stratum, and the latter would require vessels to commit, at least 4-6 months in advance of a particular period, to conduct at least some of whatever fishing they did within a specified depth stratum. These approaches also imply that vessels participating in strata with fewer total participants are likely to be observed more frequently than is the case with the current sampling strategy.

Without much higher levels of observer coverage, shorter periods of catch accounting would be associated with increasing likelihood that an inadequate number of observations would occur to permit a reasonable analytical stratification of fleet effort to be employed. **New analysis of existing observer and logbook data could be conducted to reveal the likelihood that, with existing levels of coverage, gaps in observer data for specific depth and area stratifications, over a range of time periods, would prevent reasonable application of discard rates to unobserved vessels.** Protocols would also need to be evaluated and agreed upon for revising estimates of discard, in-season, based on pooling accumulated observer data.

The program can also investigate the time taken by observers to submit their data. Currently, observers submit their data within five days of end of a trip. The program can test whether this time can be shortened without missing sea days or overburdening observers. In addition, the program can investigate how many mistakes are made in an observer's original submission of data before data quality control steps. This would give an indication as to the frequency and type of mistakes observers may be making and the steps that would have to be taken to reduce them.

In addition to these types of changes within the program for collecting observer data, fish ticket, and preferably also logbook, data would need to be available on the same schedule as the observer data. Electronic fish tickets would facilitate an accelerated ability to document the landings of observed and unobserved vessels. However, without equally rapid documentation of fishing depths, the estimation of discard would require the development of new models dependent upon algorithms for estimating the depth of fishing based on past participation and/or species composition. Use of an algorithm in place of logbook information could lead to larger error in the initial bycatch estimates, and increase the need for re-estimation once logbook data become available.

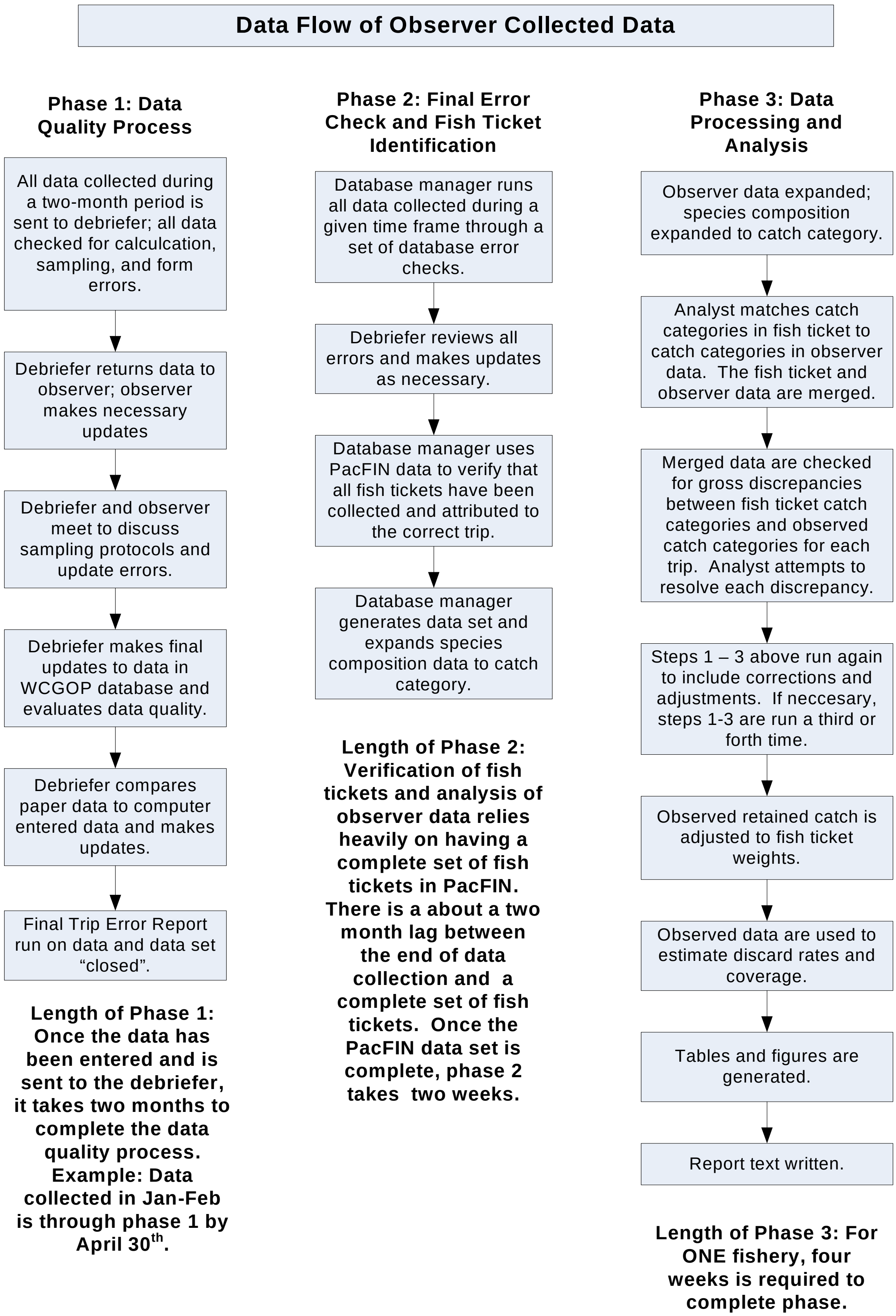


Figure 1. Overview of observer data collection, processing and analysis

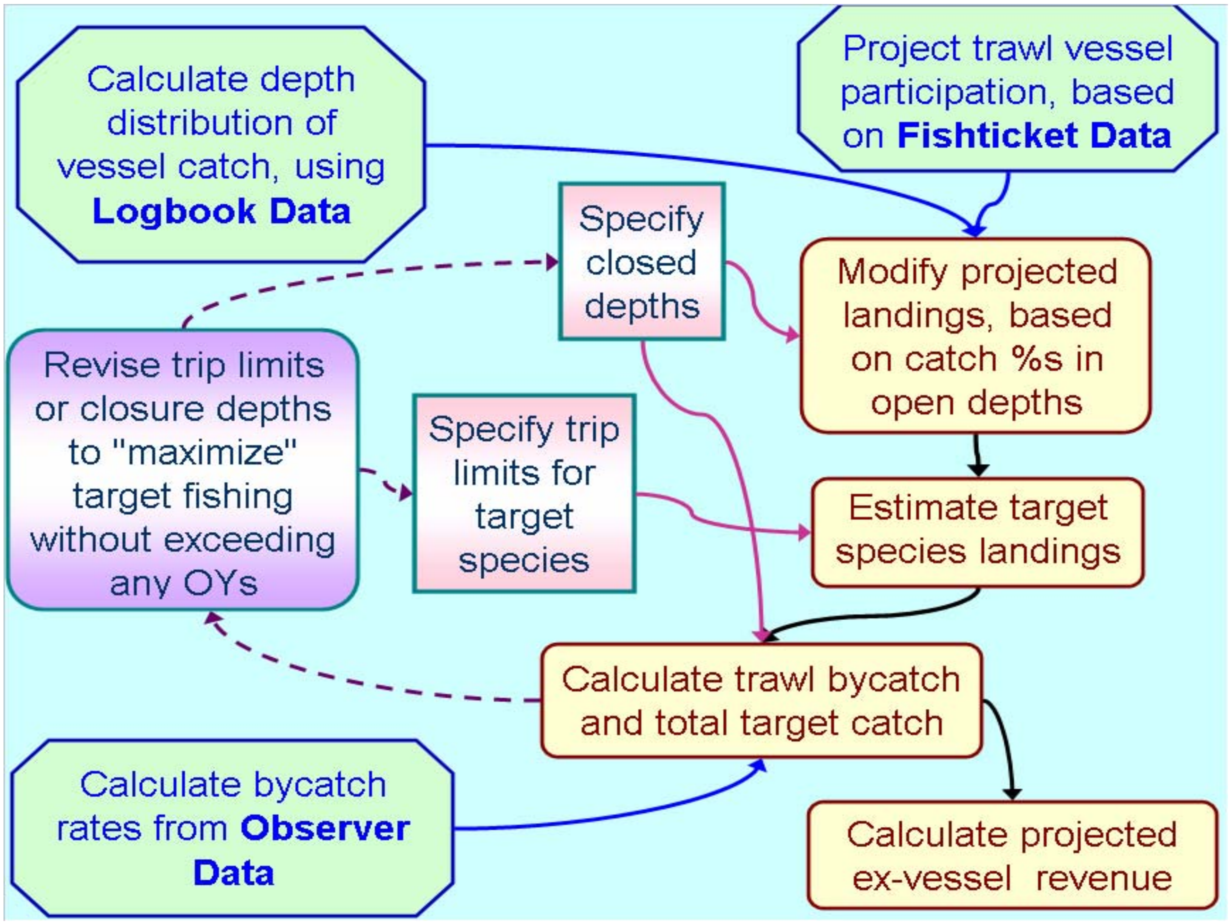


Figure 2. Schematic of the trawl bycatch model (phase 4) used by the Groundfish Management Team (model varies based on available data for each fishery)

ID	Task Name	Start	Finish	Duration
1	PHASE I – Trip Data QC	5/1/2006	6/22/2006	7.8w
2	PHASE II – Fish Ticket QC	6/27/2006	7/5/2006	1.4w
3	PHASE III – Discard Rates Determined	7/10/2006	8/10/2006	4.8w
4	PHASE IV – Bycatch Rates Determined	8/10/2006	8/31/2006	3.2w

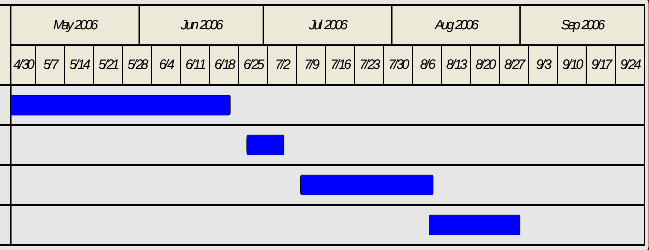


Figure 3. Example timeline for the completion of bycatch analysis for one fishery

Agenda Item F.2
Situation Summary
June 2006

TENTATIVE ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

Under this agenda item, the Council is scheduled to take tentative final action to: 1) adopt 2007-2008 optimum yields (OYs) and rebuilding plans for depleted groundfish species; 2) consider setting aside bycatch caps for proposed 2007 Exempted Fishing Permits (EFPs) (2007 EFP applications are included as Informational Reports in this briefing book); 3) adopt 2007-2008 groundfish management measures; and 4) adopt Groundfish Fishery Management Plan (FMP) Amendment 16-4 amendatory language. This tentative adoption will be followed by review and analysis by the Groundfish Management Team (GMT) and the Groundfish Advisory Subpanel (GAP) with opportunity for clarification under Agenda Item F.5 on Thursday followed by final adoption under Agenda Item F.6 on Friday.

A preliminary draft environmental impact statement (DEIS) is provided to help the Council understand the interconnected consequences of these decisions: biological – effects on living marine resources; physical – effects on habitats and the marine ecosystem; and socioeconomic – effects on fishermen, processors and, fishing communities. Excerpted sections of the preliminary DEIS are provided as Agenda Item F.2.a, Attachment 1. These excerpted sections include: Chapter 2 in its entirety, which describes the 2007-2008 OY alternatives, rebuilding alternatives, and 2007-2008 management measure alternatives; portions of Chapter 4, which describes effects of these alternatives on West Coast marine species; and portions of Chapter 7, which describes the effects of these alternatives on West Coast fishing communities. Agenda Item F.2.a, Attachment 2 is a CD copy of the preliminary DEIS with all the sections completed as of the May 24 briefing book deadline. The DEIS will be formally submitted for public review in mid-July, after the Council's final, preferred alternatives are recommended and analyzed.

Draft FMP Amendment 16-4 amendatory language has been updated with the Council's recommended modifications from the April meeting and is provided as Agenda Item F.2.a, Attachment 3. This draft is complete except for section 4.5.4, which describes the species-specific groundfish rebuilding plans. Alternate versions of section 4.5.4, which will describe rebuilding plans under the Preferred Low OY and Preferred High OY alternatives set by the Council for overfished species in April, will be supplemental attachments under this agenda item. The Council should adopt the relevant version of these species-specific rebuilding plans, consistent with the final preferred OYs it sets for the seven overfished species.

State and tribal entities have provided recommendations for 2007-2008 groundfish management and Amendment 16-4 rebuilding plans. California Department of Fish and Game's recommendations are included in Agenda Item F.2.b, CDFG Report. Oregon Department of Fish and Wildlife presents their recommendations in Agenda Item F.2.b, ODFW Report and ODFW Report 2, and Washington Department of Fish and Wildlife's recommendations are provided in Agenda Item F.2.b, WDFW Report. Additionally, public comments that were received at the Council office by the June briefing book deadline are included in Agenda Item F.2.d, Public Comments.

The Council should consider the state and tribal proposals and preliminary DEIS analyses, as well as advice from advisory bodies and the public before adopting final 2007-2008 OYs and management measures, final rebuilding plans, and the FMP Amendment 16-4 language codifying the Council's rebuilding plans. The Council may want to request additional analyses by the GMT and GAP under this agenda item. Results for any requested analyses can be provided on Thursday under Agenda Item F.5. Final Council action on 2007-2008 OYs and management measures, and Amendment 16-4 rebuilding plans is scheduled for Friday under Agenda Item F.6.

Council Action:

1. **Adopt Preferred 2007-2008 Optimum Yields for Depleted Groundfish Species.**
2. **Consider Setting Aside EFP Bycatch Caps for 2007 EFPs.**
3. **Adopt Tentative Final 2007-2008 Management Measures.**
4. **Adopt Final Amendment 16-4 FMP Language.**

Reference Materials:

1. Agenda Item F.2.a, Attachment 1: Chapter 2 of the Preliminary Draft Environmental Impact Statement on Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2007-2008 Pacific Coast Groundfish Fishery and Amendment 16-4: Rebuilding Plans for Seven Depleted Pacific Coast Groundfish Species (DEIS).
2. Agenda Item F.2.a, Attachment 2: Excerpts from Chapters 4 and 7 of the DEIS.
3. Agenda Item F.2.a, Attachment 3: Draft Amendment 16-4 (Overfished Species Rebuilding Reprise) Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery.
4. Agenda Item F.2.a, Attachment 4: ***CD Copy*** of the Preliminary Draft Environmental Impact Statement on Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2007-2008 Pacific Coast Groundfish Fishery and Amendment 16-4: Rebuilding Plans for Seven Depleted Pacific Coast Groundfish Species **(on Council briefing book CD)**.
5. Agenda Item F.2.b, CDFG Report: California Department of Fish and Game Report on Rockfish Conservation Area Management Alternatives for 2007-2008 Groundfish Management.
6. Agenda Item F.2.b, ODFW Report: Oregon Department of Fish and Wildlife Report Summarizing Public Comment Received Regarding 2007-2008 Groundfish Management.
7. Agenda Item F.2.b, ODFW Report 2: Oregon Department of Fish and Wildlife Report on the Proposed Stonewall Banks Yelloweye Rockfish Conservation Area.
8. Agenda Item F.2.b, WDFW Report: Washington Department Of Fish And Wildlife Report on 2007-2008 Groundfish Fishery Specifications/Management Measures and Amendment 16-4.
9. Agenda Item F.2.d, Public Comment.

Agenda Order:

a. Agenda Item Overview John DeVore
b. State, Tribal, and Federal Agency Recommendations
c. Reports and Comments of Advisory Bodies
d. Public Comments
e. **Council Action:** Tentative Adoption of 2007-2008 Final Acceptable Biological Catches (ABCs), Optimum Yields (OYs), Management Measures, and Revised Rebuilding Plans for Overfished Species (Amendment 16-4)

PFMC
05/26/06

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

There are two suites of alternatives analyzed in this EIS. The first suite of alternatives is the range of 2007-2008 harvest specifications or acceptable biological catches (ABCs) and optimum yields (OYs) considered for groundfish stocks and stock complexes managed under the Groundfish FMP. The range of harvest specifications for depleted groundfish species is also analyzed to understand the potential conservation and socioeconomic consequences of alternative depleted species' rebuilding plans. Therefore, the Council's preferred 2007-2008 OY alternative serves two purposes: both as the harvest specifications for the years 2007 and 2008 and, for depleted species, as the next step in the longer term mortality schedules for rebuilding plans. The target rebuilding year for each depleted species under rebuilding is also set in this decision step as the most likely year to rebuild under the Council-preferred OY and mortality schedule. Harvest specification (and rebuilding plan) alternatives are described in section 2.1.

The second suite of alternatives analyzed in this EIS is alternative 2007-2008 management measures. Alternative management measures adopted for analysis are designed to illustrate the potential efficacy and tradeoffs of management strategies and allocations considered for the next biennial management period by the Council. The overarching objectives of 2007-2008 management measures are to stay within the Council-preferred annual OYs for groundfish stocks and stock complexes and to equitably allocate fishing opportunities and other fishery benefits across fishing sectors and regions under Council jurisdiction. Alternative 2007-2008 management measures are described in section 2.2.

2.1 Alternative Harvest Specifications

Table 2-1 depicts the alternative harvest specifications for groundfish stocks and stock complexes managed under the FMP and considered by the Council for the 2007-2008 management period. The Council decided to average projected 2007 and 2008 OYs from adopted assessments and rebuilding analyses with the intent to specify an average OY, which is applied to both years. In some cases, and only for stocks with quantitative assessments, the Council also decided to average projected ABCs for the 2007-2008 management period (see FMP §4.3.1). In cases where the OY might exceed an ABC in any one year, the OY is capped at that ABC since an ABC cannot legally be exceeded.

2.1.1 Depleted Groundfish Species

Depleted groundfish species are those with spawning biomasses that have dropped below the Council's depletion or overfished threshold of 25% of initial spawning biomass (or $B_{25\%}$). The Groundfish FMP mandates these stocks need to be rebuilt through harvest restrictions and other conservation measures to 40% of unfished biomass (or $B_{40\%}$). Furthermore, the MSA mandates these rebuilding periods need to be the shortest time possible while taking into account the status and biology of the depleted stock, the needs of fishing communities, and the interaction of the depleted stock within the marine ecosystem. This mandate was underscored in an August 2005 ruling by the Ninth Circuit Court of Appeals in a challenge to the Council's darkblotched rockfish rebuilding plan. In accordance with that ruling, the Council decided to reconsider all adopted rebuilding plans to ensure they comply with the MSA as interpreted by the courts. Therefore, the range of harvest specifications for depleted groundfish species under rebuilding and analyzed in this EIS has been expanded to more effectively analyze what it means to "rebuild in the shortest time possible, taking into account the needs of fishing communities" by considering the impacts of allowing some access to healthy fish stocks. Access to healthy fish stocks would mean some mortality of depleted species that are caught as bycatch in these fisheries would be allowed. Any harvest of depleted groundfish stocks is anticipated to be unavoidable bycatch. The Council-preferred harvest specifications for depleted species are the mortality limits for these species that the Council recommends under rebuilding to avoid disastrous short-term socioeconomic impacts to West Coast fishing communities. Rebuilding periods for depleted species are coincident with the Council's recommendation for OYs for these species and defined in the Council's rebuilding framework, as specified in the Groundfish FMP, as the median time to attain the target spawning biomass of $B_{40\%}$ under a given harvest rate or mortality schedule.

Prior to the new groundfish assessments conducted, reviewed, and adopted in 2005 under Council procedures, the depleted groundfish species under rebuilding were bocaccio (in waters south of 40°10' N latitude), canary rockfish, cowcod, darkblotched rockfish, lingcod, Pacific ocean perch, widow rockfish, and yelloweye rockfish. However, the 2005 lingcod assessment {Jagielo 2006} indicates that the coastwide lingcod stock has attained (and exceeded) the $B_{40\%}$ spawning biomass threshold and is now considered successfully rebuilt. No new species were declared depleted from the 23 groundfish assessments conducted in 2005. Therefore, the Council is continuing rebuilding plans for the other seven species only and reconsidering those plans in response to a Ninth Circuit Court of Appeals ruling discussed above and in Chapter 1. To fully analyze both the conservation needs of each depleted stock and the socioeconomic effects of alternative rebuilding plans, a wide range of OYs have been specified for analysis for each depleted species (Table 2-2a). Each of these OY alternatives is based on the best available science as recommended by Stock Assessment Review (STAR) panels and the Council's Scientific and Statistical Committee (SSC). Section 2.1.1 describes the scientific basis for each depleted species' OY alternative and describes the strategic analyses of these alternatives that are presented in more detail in subsequent chapters of this EIS.

In considering potential rebuilding alternatives, first, the consequences of each depleted species' OY alternative was examined in isolation to understand the tradeoff between the amount of allowable harvest and alternative rebuilding periods and to identify the West Coast fisheries that are affected by the constraints posed by alternative rebuilding plans for each particular depleted species. The predicted rebuilding periods and the annual OYs that describe the alternative rebuilding schedules, each of which define a rebuilding plan, are estimated using the SSC's endorsed rebuilding program {Punt 2005}. The rebuilding program is a probabilistic population simulator that explores alternative harvest rates and predicts the total mortality and duration of rebuilding for each depleted species under a range of harvest rates. The depleted species' OY alternatives analyzed in this EIS, based on harvest rates estimated from the rebuilding simulation program, are calculated using an instantaneous rate of fishing mortality (F), which may be converted to a Spawning Potential Ratio. For ease of comparison among stocks and to standardize the basis of rebuilding calculations, it is useful to express any specific fishing mortality rate in terms of its effect on Spawning Potential Ratio (SPR = spawning per recruit at the current population level relative to that at the stock's unfished condition). Given fishery selectivity patterns and basic life history parameters, there is a direct inverse relationship between F and SPR (Figure 2-1). When there is no fishing, each new female recruit is expected to achieve 100% of its spawning potential. As fishing intensity increases, expected lifetime reproduction declines due to this added source of mortality. Conversion of F into the equivalent SPR has the benefit of standardizing for differences in growth, maturity, fecundity, natural mortality, and fishery selectivity patterns and, as a consequence, the Council's SSC recommends it be used routinely. The rebuilding program is more thoroughly described in Chapter 6. The OY alternatives for depleted species are described in section 2.1.1.1.

Table 2-1. Council-adopted alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2007 and 2008. (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative				2007 and 2008 Action Alternatives a/												
	2005 ABC	2005 OY	2006 ABC	2006 OY	Alt 1 2007 ABC	Alt 2 2007 ABC	Alt 1 2008 ABC	Alt 2 2008 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Council 2007 ABC b/	Council 2008 ABC b/	Council OY b/
Lingcod - coastwide c/	2,922	2,414	2,716	2,414	6,706		5,853		6,280	6,088					6,280	6,280	
Columbia and US-Vanc. areas		1,694		1,694					5,428	5,428							
Eureka, Monterey, and Conception areas		719		719					852	660							
N. of 42 (OR & WA)		1,801		1,801					5,558	5,558							5,558
S. of 42 (CA)		612		612					722	530							612
Pacific Cod	3,200	1,600	3,200	1,600	3,200		3,200		1,600						3,200	3,200	1,600
Pacific Whiting (U.S.)	269,545	269,069	488,850	269,069	244,425	733,275	244,425	733,275	134,534	403,604					To be determined in March 2007 and 2008		
Sablefish (Coastwide)	8,368	7,761	8,175	7,634	6,210		6,058		4,574	5,934					6,210	6,058	5,934 d/
N. of 36 (Monterey north)		7,486		7,363					4,411	5,723							
S. of 36 (Conception area)		275		271					162	210							
PACIFIC OCEAN PERCH	966	447	934	447	900		911		0	87	405	514	749		900	911	44 or 100
Shortbelly Rockfish	13,900	13,900	13,900	13,900	13,900		13,900		13,900						13,900	13,900	13,900
WIDOW ROCKFISH	3,218	285	3,059	289	5,334		5,144		0	329	456	917	1,369		5,334	5,144	120 or 368
CANARY ROCKFISH	270	47	279	47	172		179		0	24	44	68			172	179	32 or 44
Chilipepper Rockfish	2,700	2,000	2,700	2,000	2,700		2,700		2,000	2,700					2,700	2,700	2,000
BOCACCIO	566	307	549	309	602		618		0	149	218	315	424		602	618	40 or 218
Splitnose Rockfish	615	461	615	461	615		615		461						615	615	461
Yellowtail Rockfish	3,896	3,896	3,681	3,681	4,585		4,510		4,548						4,548	4,548	4,548
Shortspine Thornyhead - coastwide					2,488		2,463		1,661	2,476					2,476	2,476	e/
Shortspine Thornyhead - N. of 34deg27'	1,055	999	1,077	1,018					1,240	1,634							1,634
Shortspine Thornyhead - S. of 34deg27'									421	841							421
Longspine Thornyhead - coastwide	2,851	2,656	2,851	2,656	3,953		3,860		2,696	3,930					3,907	3,907	e/
Longspine Thornyhead - N. of 34deg27'		2,461		2,461					2,220	2,989							2,220
Longspine Thornyhead - S. of 34deg27'		195		195					476	941							476
COWCOD - S. of 36 (Conception area)	5	2.1	5	2.1	17		17		0	4	7	9	11		17	17	4 or 8 f/
COWCOD - Monterey area	19	2.1	19	2.1	19		19		0	4	7	9	11		19	19	
DARKBLOTCHED	269	269	294	200	456		487		0	130	229	330	472		456	487	130 or 229

Table 2-1. Council-adopted alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2007 and 2008 (continued). (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative				2007 and 2008 Action Alternatives a/												
	2005 ABC	2005 OY	2006 ABC	2006 OY	Alt 1 2007 ABC	Alt 2 2007 ABC	Alt 1 2008 ABC	Alt 2 2008 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Council 2007 ABC b/	Council 2008 ABC b/	Council OY b/
YELLOWEYE g/	54	26	55	27	26		26		0	12	~~17~~	~~21~~	~~24~~	~~27~~	26	26	12.6 or ramp-down h/
Nearshore Species																	
Black Rockfish (WA)	540	540	540	540	540		540		540						540	540	540
Black Rockfish (OR-CA)	753	753	736	736	725		719		722						722	722	722
Minor Rockfish North	3,680	2,250	3,680	2,250	3,680				2,250	2,270	2,290				3,680	3,680	2,270
Nearshore Species		122		122					122	142	162						142
Shelf Species		968		968			968		968	968	968						968
Slope Species		1,160		1,160			1,160		1,160	1,160	1,160						1,160
Remaining Rockfish North i/	1,612	1,216	1,612	1,216	1,612		1,612		1,216								
Bocaccio	318	239	318	239	318		318		239								
Chilipepper - Eureka	32	32	32	32	32		32		32								
Redstripe	576	432	576	432	576		576		432								
Sharpchin	307	230	307	230	307		307		230								
Silvergrey	38	29	38	29	38		38		29								
Splitnose	242	182	242	182	242		242		182								
Yellowmouth	99	74	99	74	99		99		74								
Other Rockfish North i/	2,068	1,034	2,068	1,034	2,068		2,068		1,034								
Minor Rockfish South	3,412	1,968	3,412	1,968	3,403		3,403		1,753	1,855	1,931	2,006			3,403	3,403	1,904
Nearshore Species		615		615					413	515	591	666					564
Shelf Species		714		714					714	714	714	714					714
Slope Species		639		639					626	626	626	626					626
Remaining Rockfish South i/	854	689	854	689	854		854		689								
Bank	350	263	350	263	350		350		263								
Blackgill	343	305	343	305	292		292		292								
Gopher	97	48.5	97	48.5	302		302		49	151	227	302					
Sharpchin	45	34	45	34	45		45		34								
Yellowtail	116	87	116	87	116		116		87								
Other Rockfish South i/	2,558	1,279	2,558	1,279	2,558		2,558		1,279								

Table 2-1. Council-adopted alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2007 and 2008 (continued). (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative				2007 and 2008 Action Alternatives a/												
	2005 ABC	2005 OY	2006 ABC	2006 OY	Alt 1 2007 ABC	Alt 2 2007 ABC	Alt 1 2008 ABC	Alt 2 2008 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Council 2007 ABC b/	Council 2008 ABC b/	Council OY b/
California scorpionfish	Not specified - managed as part of Minor RF South				137	219	137	219	137	219					219	219	175
Cabezon (off CA only)	103	69	108	69	94		94		69						94	94	69
Dover Sole	8,522	7,476	8,589	7,564	28,522		28,442		16,500	28,482					28,522	28,442	16,500
English Sole	3,100	3,100	3,100	3,100	6,773		5,701		6,237						6,237	6,237	6,237
Petrale Sole (coastwide) c/	2,762	2,762	2,762	2,762	2,917		2,919		1,921	2,499	2,883				2,917	2,919	2,499
Columbia and US-Vanc. areas									910	1,347	1,347						
Eureka, Monterey, and Conception areas									1,012	1,152	1,536						
N of 40deg10'									1,176	1,651	1,752						
S of 40deg10'									745	848	1,131						
Arrowtooth Flounder	5,800	5,800	5,800	5,800	5,800		5,800		5,800						5,800	5,800	5,800
Starry Flounder	Not specified - managed as part of Other Flatfish				1,221		1,395		890	1,186					1,221	1,221	890
Other Flatfish	6,781	4,909	6,781	4,909	6,731		6,731		4,884						6,731	6,731	4,884
Other Fish	14,600	7,300	14,600	7,300	14,600		14,600		7,300						14,600	14,600	7,300
Kelp Greenling HG (OR)									No Fed HG	fed HG = state HG							No Fed HG

a/ The Council elected to average OY projections for 2007 and 2008 and analyze/specify the average OYs for each year. ABCs, in some cases, are specified similarly for some species with quantitative assessments. Otherwise, ABCs are year-specific.

b/ Council ABC and Council OY represent the Council's preferred harvest alternative for 2007 and 2008.

c/ Area OYs/HGs are stratified according to the assessment areas and alternatively adjusted by management areas for lingcod and petrale sole.

d/ The Council specified a coastwide 2007-2008 sablefish OY (Alt. 2 OY). However, sector allocations are based on the portion of the OY north of 36 deg. N. lat.

e/ A coastwide OY was not adopted for longspine and shortspine thornyheads. Separate OYs north and south of Pt. Conception at 34deg.27' N. lat. were specified.

f/ The preferred OY is for the Conception and Monterey areas combined.

g/ The yelloweye OY alternatives originally specified for analysis in Nov. 2005 were based on the 2005 assessment. The revised 2006 assessment and rebuilding analysis, adopted in Mar. 2006, projects a range of allowable 2007-2008 OYs under a constant harvest rate strategy of <=15 mt. Therefore, alternatives 3-6 were eliminated from further analysis.

h/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.

i/ The Remaining Rockfish and Other Rockfish categories are shown to understand how the Minor Rockfish complex harvest specifications are derived. These are not management targets.

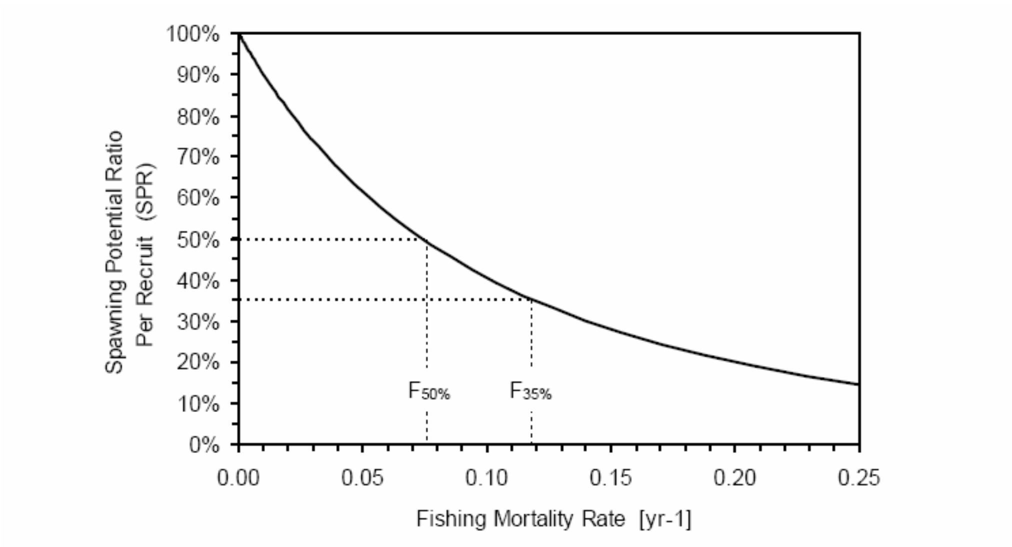


Figure 2-1. Relationship between spawning potential ratio (SPR) and instantaneous fishing mortality rate (F) for a hypothetical rockfish.

Next, rebuilding alternatives were developed by arranging the depleted species' OYs in various combinations (Table 2-2b) and then modeling changes to the current management regime to understand how rebuilding plans for different species interact to constrain fishing opportunities. The OYs in these rebuilding alternatives are strategically arrayed to illuminate how each species might differentially constrain fishing opportunities by sector (or gear type) and region along the West Coast, depending on the amount of allowable harvest of each species. It is important to note that the full range of OY alternatives described in Table 2-2a are not used to structure these rebuilding alternatives. Some of the higher OY alternatives in Table 2-2a are not used to structure the rebuilding alternatives in Table 2-2b. For example, the highest OY alternative for widow rockfish (OY Alternative 5) was not included among the rebuilding alternatives because it represents an amount of bycatch not observed in the current management regime. Prior to 2003, when there was a directed midwater trawl fishery for yellowtail and widow rockfish, catches of widow rockfish approached the level of mortality consistent with the OY Alternative 5 in Table 2-2a. However, the current understanding of the association of the more constraining canary rockfish stock with yellowtail rockfish leads to the conclusion that the available potential harvest of canary rockfish (as described by the range of OYs in Table 2-2a) would constrain any directed midwater trawl opportunities for yellowtail rockfish before the widow rockfish bycatch would approach the higher available OYs for that stock. Therefore, the rebuilding alternatives in Table 2-2b are structured using a narrower range of depleted species' OYs than those depicted in Table 2-2a. The rebuilding alternatives are described in detail below, in Section 2.1.1.2.

At their April 2006 meeting, the Council selected a preferred OY alternative for all managed groundfish species and species complexes except for the seven depleted species (Table 2-1). For the depleted species, the Council selected two preferred OY alternatives for further analysis for each stock. A final preferred OY and rebuilding plan for each depleted species will be decided at the June 2006 Council meeting. As discussed above, the Council's preferred OY alternative for the 2007-2008 fisheries must be consistent with any intent to modify depleted species rebuilding plans. Therefore, the choice of a preferred OY alternative involves consideration of both short-term effects (during 2007-2008) and long-term effects (the future application of rebuilding plans as revised by Amendment 16-4).

2.1.1.1 Optimum Yield Alternatives for Depleted Species

Table 2.2a depicts the range of depleted species' OY alternatives specified for analysis by the Council in November 2005 and April 2006. The numbered OY alternatives in Table 2-2a correspond to the alternative harvest levels that the Council originally selected for analysis in November 2005. In April 2006, the Council decided that the Preferred Low OY and High OY alternatives would represent the range of OYs that should be the focus of more detailed analysis. These preferred OY alternatives will be the range the Council will select from in June 2006 when final depleted species' OYs and rebuilding plans will be adopted. Table 2-3 and Figure 2-2 indicate the median time to rebuild under each 2007-2008 OY alternative.

Table 2-2a. Range of 2007-2008 OYs for depleted groundfish species decided at the November 2005 and April 2006 Council meetings.

		2007-2008 OYs (mt)							
Stock	**Association**	**OY Alt. 1**	**OY Alt. 2**	**OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**	**OY Alt. 6**	**Pref. Low OY Alt.**	**Pref. High OY Alt.**
Yelloweye a/	Northern Shelf	0	12	~~17~~	~~21~~	~~24~~	~~27~~	12.6	Ramp-down b/
Canary		0	24	44	68			32	44
Cowcod c/	Southern Shelf	0	8	14	18	22		4	8
Bocaccio		0	149	218	315	424		40	218
Darkblotched	Northern Slope	0	130	229	330	472		130	229
POP		0	87	405	514	749		44	100
Widow	Midwater	0	329	456	917	1,369		120	368

a/ A 2007-2008 OY >= 15 mt for yelloweye would result in a less than a 50% probability of rebuilding before Tmax, which is not legally viable. OY Alternatives 3-6 are discussed further in section 2.1.5 of the EIS.

b/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.

c/ OY alternatives for Conception and Monterey areas combined.

Table 2-2b. Amendment 16-4 rebuilding alternatives.

		2007-2008 OYs (mt)					
Stock	**Association**	**"Status Quo" Reb. Alt. a/**	**Reb. Alt. 1**	**Reb. Alt. 2**	**Reb. Alt. 3**	**Reb. Alt. 4**	**Reb. Alt. 5**
Yelloweye	Northern Shelf	27	21	17	21	12	12
Canary		44	24	44	68	24	24
Cowcod b/	Southern Shelf	5	8	18	22	14	3
Bocaccio		149	149	218	424	315	40
Darkblotched	Northern Slope	229	330	229	472	472	130
POP		87	405	87	749	405	44
Widow	Midwater	329	456	329	917	329	120

a/ The species' OYs described in the "status quo" rebuilding alternative are determined by calculating the effective SPR harvest rate from the November 2005 bycatch scorecard and projecting this harvest rate forward to 2007.

b/ OY alternatives for Conception and Monterey areas combined.

Table 2-3. Estimated time to rebuild relative to the alternative 2007-2008 OYs for depleted West Coast groundfish species.

Species	Year Stock Declared Overfished	Ttarget in the FMP (Status Quo)	OY Alt. a/	Median Time to Rebuild	2007-08 OY (mt)	SPR Harvest Rate	2007-08 ABC (mt)	Tmin	Tmax	T (F=0)
Bocaccio	1999	2023	1	2021.1	0	100%	602	2018	2032	2021
(S of 40deg10')			Pref. Low OY	2021.9	40	92.8%				
				2024	106	88.3%				
			2	2024	149	84.4%				
			Pref. High OY (3)	2026	218	77.7%				
			4	2029	315	69.2%				
			5	2032	424					
				2050	602					
Canary	2000	2074	1	2053	0	100%	172	2048	2071	2053
			2	2058	24	93.5%				
			Pref. Low OY	2060	32	91.6%				
			Pref. High OY (3)	2063	44	88.7%				
			4	2071	68	83.1%				
Cowcod	2000	2090	1	2035	0	100%	26	2035	2074	2035
(Concep.+ Monterey areas)			Pref. Low OY	2039	4	90.0%				
				2040	4.6	90.0%				
			Pref. High OY (2)	2043	8	85.0%				
			3	2052	14	75.0%				
			4	2062	18	69.0%				
			5	2074	22	63.0%				
Darkblotched b/	2000	2030	1	2009.5	0	100%	456	2009	2033	2009.5
			Pref. Low OY (2)	2009.9	130	100%				
			Pref. High OY (3)	2010.2	229	100%				
			4	2010.5	330	100%				
			5	2012	472	50.0%				
				~~2014~~	~~521~~	~~46.1%~~				
				~~2016~~	~~581~~	~~42.9%~~				
				~~2033~~	~~696~~	~~37.6%~~				

Table 2-3. Estimated time to rebuild relative to the alternative 2007-2008 OYs for depleted West Coast groundfish species (continued).

Species	Year Stock Declared Overfished	Ttarget in the FMP (Status Quo)	OY Alt. a/	Median Time to Rebuild	2007-08 OY (mt)	SPR Harvest Rate	2007-08 ABC (mt)	Tmin	Tmax	T (F=0)
POP	1999	2026	1	2014.6	0	100%	900	2015	2043	2014.6
			Pref. Low OY	2015	44	95.5%				
			2	2015	87	92.0%				
			Pref. High OY	2015.6	100	90.5%				
			3	2021	405	69.6%				
			4	2025	514	64.4%				
			5	2048	749	54.4%				
Widow	2001	2038	1	2013	0	100%	5,334	2013	2033	2013
			Pref. Low OY	2014	120	97.3%				
			2	2015	329	96.0%				
			Pref. High OY	2015	368	95.0%				
			3	2016	456	93.6%				
			4	2020	917	88.6%				
			5	2027	1,369	83.4%				
Yelloweye c/	2002	2058	1	2048	0	100%	26	2046	2096	2048
			2	2078	12	73.8%				
			Pref. Low OY	2083	12.6	71.9%				
			Pref. High OY	2083.5	Ramp Down d/	NA				
			~~3~~	~~2097~~	~~17~~					
			~~4~~	~~2068~~	~~21~~					
			~~5~~	~~2080~~	~~24~~					
			~~6~~	~~2099~~	~~27~~					

a/ The numbered OY alternatives were specified for analysis by the Council in Nov. 2005. The Preferred OY alternatives were specified for analysis by the Council in April 2006.

b/ Darkblotched OY alternatives cannot exceed the ABC (456 mt in 2007 and 486 mt in 2008). Therefore, OY Alt. 5 can only be considered in 2008.

c/ A 2007-2008 OY >= 15 mt for yelloweye would result in a less than a 50% probability of rebuilding before Tmax, which is not legally viable. Alternatives 3-6 are discussed further in section 2.1.5 of the EIS.

d/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.

Bocaccio (in Waters off California South of 40°10' N Latitude)

The OY alternatives specified for analysis for the bocaccio stock south of 40°10' N latitude are 0 mt, 40 mt, 149 mt, 218 mt, 315 mt, and 424 mt (Tables 2-1 and 2-2a). This compares to the status quo OYs of 307 mt in 2005 and 309 mt in 2006.

The zero harvest alternative would rebuild the stock by 2021, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

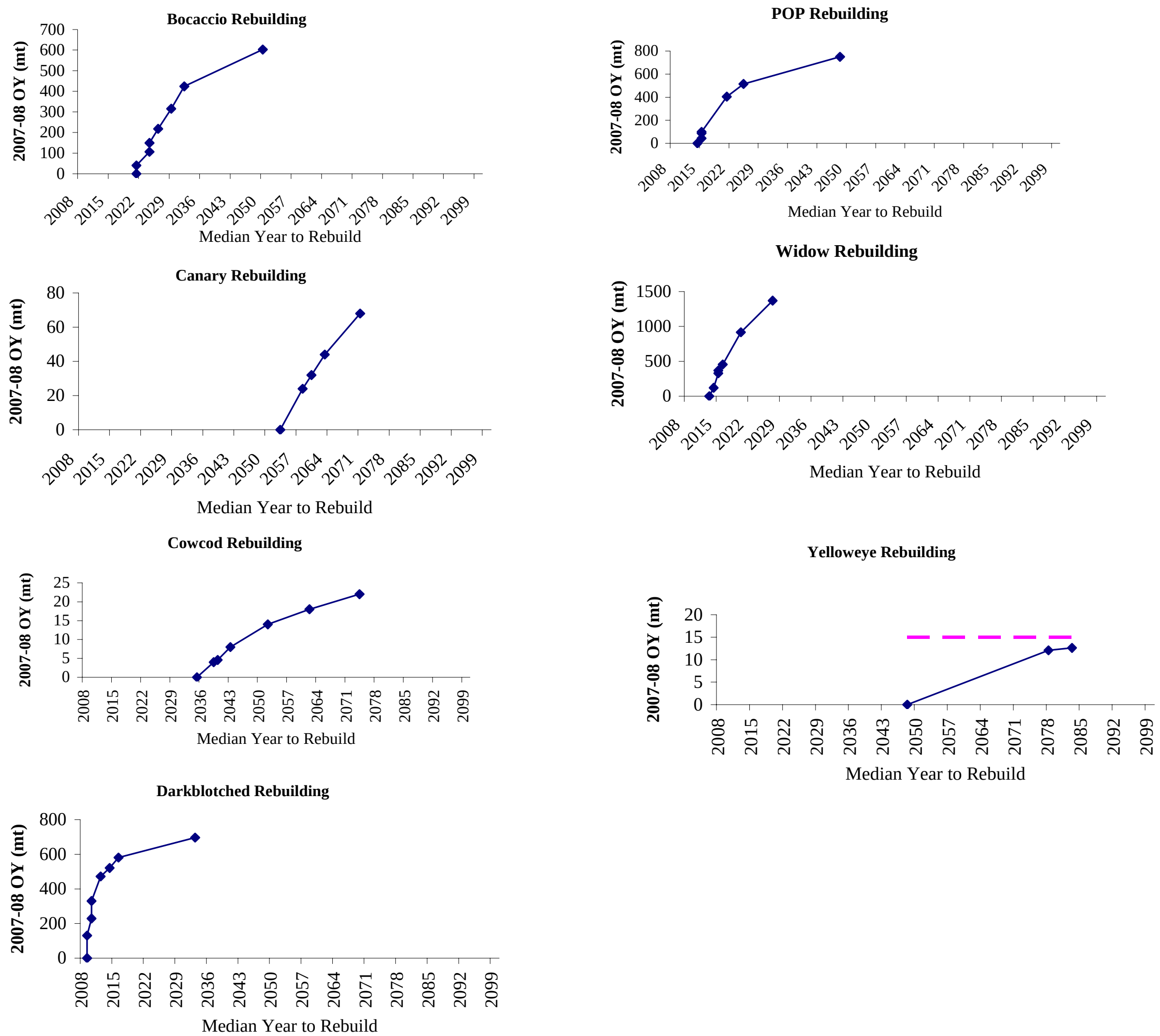


Figure 2-2. Predicted rebuilding duration vs. allowable 2007-2008 harvests for seven depleted West Coast groundfish species.

The 40 mt alternative is the Council's **Preferred Low OY Alternative** specified by the Council in April 2006. The median time to rebuild the stock under this alternative is 2021.9, or about 10 months longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 149 mt alternative is based on the effective harvest rate in 2005 projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying the best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting rate to the projected exploitable biomass in 2007 and 2008 {MacCall 2006a} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2024, or 3 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 218 mt OY alternative is the Council's **Preferred High OY Alternative** and represents the OY under an 80% rebuilding probability (P_{MAX} or the probability of successfully rebuilding the stock in the maximum allowable time under the current National Standard 1 Guidelines) from the 2003 rebuilding analysis {MacCall 2003b}. The median time to rebuild the stock under this alternative would be 2026, or 5 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 315 mt OY alternative represents the current SPR harvest rate of 69.2% applied to the 2007 and 2008 projections of exploitable biomass. This is the harvest rate used to establish the status quo 2005 and 2006 OYs. The median time to rebuild the stock under this alternative would be 2029, or 8 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 424 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {MacCall 2006}. This is the highest OY that can be considered for bocaccio in that it is based on the best available science and is at the 50% rebuilding probability threshold established in litigation (*Natural Resources Defense Council v. Daley*, April 25, 2000, U.S. Court of Appeals for the District of Columbia Circuit). The median time to rebuild the stock under this alternative would be 2032, or 11 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Canary Rockfish

The OY alternatives specified for analysis for the coastwide canary rockfish stock are 0 mt, 24 mt, 32 mt, 44 mt, and 68 mt (Tables 2-1 and 2-2a). This compares to the status quo OY of 47 mt in 2005 and 2006.

The zero harvest alternative would rebuild the stock by 2053, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 24 mt OY alternative represents the OY under a 60% rebuilding probability (the status quo P_{MAX}) from the new rebuilding analysis {Methot 2006}. The median time to rebuild the stock under this alternative would be 2058, or 5 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 32 mt alternative is the Council's **Preferred Low OY Alternative**. The median time to rebuild the stock under this alternative is 2060, or 7 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 44 mt OY alternative is the Council's **Preferred High OY Alternative** and applies the current SPR harvest rate of 88.7% to the 2007 and 2008 projections of exploitable biomass. This is the harvest rate used to establish the status quo 2005 and 2006 OYs. The median time to rebuild the stock under this alternative would be 2063, or 10 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 68 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {Methot 2006}. This is the highest OY that can be considered for canary rockfish in that it is based on the best available science and is at the 50% rebuilding probability threshold. The median time to rebuild the stock under this alternative would be 2071, or 18 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Cowcod

The OY alternatives specified for analysis for the cowcod stock occurring in the Conception and Monterey INPFC areas are 0 mt, 8 mt, 14 mt, 18 mt, and 22 mt (Tables 2-1 and 2-2a). This compares to the status quo OY of 4.2 mt in 2005 and 2006.

The zero harvest alternative would rebuild the stock by 2035, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 4 mt alternative is the Council's **Preferred Low OY Alternative** specified by the Council in April 2006. The median time to rebuild the stock under this alternative is 2039, or 4 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 8 mt OY alternative is the Council's **Preferred High OY Alternative** and represents the OY under a re-estimated 80% rebuilding probability from the new rebuilding analysis {Piner 2006}. The median time to rebuild the stock under this alternative would be 2043, or 8 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 14 mt OY alternative represents the OY under a re-estimated 70% rebuilding probability from the new rebuilding analysis {Piner 2006}. The median time to rebuild the stock under this alternative would be 2052, or 17 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 18 mt OY alternative represents the OY under a re-estimated 60% rebuilding probability (the status quo P_{MAX}) from the new rebuilding analysis {Piner 2006}. The median time to rebuild the stock under this alternative would be 2062, or 27 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 22 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {Piner 2006}. This is the highest OY that can be considered for canary rockfish in that it is based on the best available science and is at the 50% rebuilding probability threshold. The median time to rebuild the stock under this alternative would be 2074, or 39 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Darkblotched Rockfish

The OY alternatives specified for analysis for the coastwide darkblotched rockfish stock are 0 mt, 130 mt, 229 mt, 330 mt, and 424 mt (Tables 2-1 and 2-2a). This compares to the status quo OYs of 269 mt in 2005 and 200 mt in 2006.

The zero harvest alternative would rebuild the stock by 2009.5, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 130 mt OY alternative is the Council's **Preferred Low OY Alternative** and represents the OY specified in 2001. The Ninth Circuit court ruling compelling the Council and NMFS to consider Amendment 16-4 disputed the 2002 darkblotched harvest specification, which had changed this 2001 OY to a higher value. The median time to rebuild the stock under this alternative would be 2009.9, or approximately 5 months longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 229 mt OY alternative is the Council's **Preferred High OY Alternative** and is based on the effective harvest rate in 2005 (F = 0.0216) projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying its best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting harvest rate to the projected exploitable biomass in 2007 and 2008 {Rogers 2006a} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2010.2, or approximately 8 months longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 330 mt OY alternative applies the harvest rate used to set the 2005 OY (F = 0.032) to the 2007 and 2008 projections of exploitable biomass (OYs averaged and applied to each year). The median time to rebuild the stock under this alternative would be 2010.5, or 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 472 mt OY alternative represents the OY capped at the average 2007-2008 ABC specification. This is the highest OY that can be considered for darkblotched rockfish in that the ABC cannot be legally exceeded. The re-estimated P_{MAX} under this alternative is 97%. The median time to rebuild the stock under this alternative would be 2012, or 2.5 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Pacific Ocean Perch

The OY alternatives specified for analysis for the coastwide Pacific ocean perch (POP) stock are 0 mt, 44 mt, 87 mt, 100 mt, 405 mt, 514 mt, and 749 mt (Tables 2-1 and 2-2a). This compares to the status quo OY of 447 mt in 2005 and 2006.

The zero harvest alternative would rebuild the stock by 2014.6, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 44 mt alternative is the Council's **Preferred Low OY Alternative** specified by the Council in April 2006. The median time to rebuild the stock under this alternative is 2015, or about half a year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 87 mt OY alternative is based on the effective harvest rate in 2005 projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying its best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting harvest rate to the projected exploitable biomass in 2007 and 2008 {Hamel 2006b} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2015.4, or about 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 100 mt OY alternative is the Council's **Preferred High OY Alternative**. The median time to rebuild the stock under this alternative would be 2015.6, or 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 405 mt OY alternative represents the OY under a re-estimated 80% rebuilding probability from the new rebuilding analysis {Hamel 2006b}. The estimated SPR harvest rate under this alternative is 69.6%. The median time to rebuild the stock under this alternative would be 2021, or approximately 7 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 514 mt OY alternative represents the OY under a re-estimated 70% rebuilding probability (the status quo P_{MAX}) from the new rebuilding analysis {Hamel 2006b}. The median time to rebuild the stock under this alternative would be 2025, or 11 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 749 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {Hamel 2006b}. This is the highest OY that can be considered for POP in that it is based on the best available science and is at the 50% rebuilding probability threshold. The median time to rebuild the stock under this alternative would be 2048, or 34 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Widow Rockfish

The OY alternatives specified for analysis for the coastwide widow rockfish stock are 0 mt, 120 mt, 329 mt, 368 mt, 456 mt, 917 mt, and 1,369 mt (Tables 2-1 and 2-2a). This compares to the status quo OYs of 285 mt in 2005 and 289 mt in 2006.

The zero harvest alternative would rebuild the stock by 2013, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 120 mt alternative is the Council's **Preferred Low OY Alternative** and is predicted to rebuild the stock by 2014, which is 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 329 mt OY alternative is based on the effective harvest rate in 2005 projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying its best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting harvest rate to the projected exploitable biomass in 2007 and 2008 {He et al. 2006b} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2015, or 2 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 368 mt alternative is the Council's **Preferred High OY Alternative** and is predicted to rebuild the stock by 2015, which is 2 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 456 mt OY alternative applies the current SPR harvest rate of 93.6% to the 2007 and 2008 projections of exploitable biomass. This is the harvest rate used to establish the status quo 2005 and 2006 OYs. The median time to rebuild the stock under this alternative would be 2016, or approximately 3 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 917 mt OY alternative represents the OY under a re-estimated 80% rebuilding probability from the new rebuilding analysis {He et al. 2006b}. The SPR harvest rate under this alternative is estimated to be 88.6%. The median time to rebuild the stock under this alternative would be 2020, or 7 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 1,369 mt OY alternative represents the OY under a re-estimated P_{MAX} of 60% from the new rebuilding analysis {He et al. 2006b}. The median time to rebuild the stock under this alternative would be 2027, or 14 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Yelloweye Rockfish

The OY alternatives originally specified for analysis for the coastwide yelloweye rockfish stock were 0 mt, 12 mt, 17 mt, 21 mt, 24 mt, and 27 mt (Tables 2-1 and 2-2a). The first five yelloweye OY alternatives were derived from the 2005 yelloweye assessment and rebuilding analysis. However, in November 2005 the Council requested a new yelloweye assessment be done over the winter when numerous assessment data issues became known. The Council also specified the status quo 27 mt OY alternative for analysis in case a new, more optimistic assessment and rebuilding analysis were approved in 2006.

A new yelloweye stock assessment {Wallace et al. 2006} and rebuilding analysis {Tsou and Wallace 2006} were approved in March 2006. The new 2006 assessment was more pessimistic than the 2005 assessment and one implication of the new rebuilding analysis was that the projected range of allowable 2007-2008 OYs under a constant harvest rate strategy is ≤ 15 mt. That is, higher OYs would result in rebuilding probabilities ≤ 50%, which is not legally viable. Therefore, yelloweye OY Alternatives 3-6 in Table 2-2a were eliminated from further detailed study (see section 2.1.5).

The Council adopted for analysis a new OY alternative of 12.6 mt for 2007-2008 and consideration of a yelloweye harvest rate ramp-down strategy, which is explained in more detail below. Therefore, the full range of viable yelloweye OY alternatives analyzed for 2007-2008 and Amendment 16-4 are 0 mt, 12 mt, 12.6 mt, and the harvest rate ramp-down strategy, which specifies OYs of 23 mt and 20 mt for 2007 and 2008, respectively. This compares to the status quo OYs of 26 mt in 2005 and 27 mt in 2006.

The zero harvest alternative would rebuild the stock by 2048, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 12 mt OY alternative would rebuild the stock by 2078, or 30 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 12.6 mt alternative is the Council's **Preferred Low OY Alternative** and is based on a re-estimated 80% rebuilding probability from the new rebuilding analysis {Tsou and Wallace 2006}. This is the rebuilding probability from the status quo rebuilding plan and the SPR harvest rate under this alternative is estimated to be 71.9%. The median time to rebuild the stock under this alternative would be 2083, or 35 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The yelloweye harvest rate ramp-down strategy is the Council's **Preferred High OY Alternative** and is designed to provide the Council time to develop management strategies to reduce current yelloweye impacts by more than 50%. The ramp-down strategy would sequentially lower the yelloweye harvest rate in the next four years before resuming a constant harvest rate rebuilding strategy in 2011. The OYs would be 23 mt, 20 mt, 17 mt, and 14 mt in 2007-2010. Under this strategy, the constant harvest rate would be the same as for the Preferred Low OY Alternative (SPR harvest rate = 71.9%) beginning in 2011. The median time to rebuild the stock under this alternative would be 2083.5, or 35.5 years longer than $T_{F=0}$ and about a half a year longer than the Preferred Low OY Alternative (Table 2-3 and Figure 2-2).

2.1.1.2 Rebuilding Alternatives

There are six rebuilding alternatives analyzed in this EIS (Table 2-2b). Each alternative was strategically developed to better compare and contrast the tradeoffs associated with alternative rebuilding strategies. These alternatives are analyzed by predicting the effect on the status quo management regime. Multiple suboptions are presented for each alternative to explore potential effects under different allocation scenarios.

The "status quo" rebuilding alternative is comprised of OY alternatives based on the effective harvest rates for each of the depleted stocks in 2005 projected forward to 2007 and 2008. The effective harvest rates were determined by applying the GMT's best estimate of total mortality in 2005 divided by the exploitable biomass of each stock in 2005. These harvest rates were then applied to the projected best exploitable biomasses in 2007 and 2008 to determine projected OYs.

Rebuilding alternative 1 would result in an increase in slope and midwater trawl fishing opportunities with the higher darkblotched, POP, and widow OYs; and a corresponding decrease in shelf fishing opportunities with the lower OYs for bocaccio, canary, cowcod, and yelloweye.

Rebuilding alternative 2 would result in higher southern shelf fishing opportunities with the higher bocaccio and cowcod OYs; lower northern recreational and limited entry and open access fixed gear opportunities with the lower yelloweye OY; and close to status quo for northern bottom and midwater trawl fishing opportunities with the "status quo" OYs for darkblotched, POP, and widow.

Rebuilding alternative 3 would result in higher shelf fish opportunities north and south with the higher bocaccio, cowcod, canary, and yelloweye OYs; and higher slope and midwater trawl fishing opportunities with the higher OYs for darkblotched, POP, and widow.

Rebuilding alternative 4 would dramatically lower northern shelf opportunities and some additional constraints in southern shelf fisheries north of Point Conception with the lower canary and yelloweye OYs; higher shelf fishing opportunities south of Pt. Conception with the higher bocaccio and cowcod OYs; and higher slope and midwater trawl opportunities with the higher darkblotched, POP, and widow OYs.

Rebuilding alternative 5 would dramatically lower shelf fishing opportunities coastwide with the lower bocaccio, cowcod, canary, and yelloweye OYs; and dramatically lower slope and midwater trawl fishing opportunities with the lower darkblotched, POP, and widow OYs.

2.1.2 Precautionary Zone Groundfish Species

Cabezon (in Waters off California)

The Council has identified one OY alternative, 69 mt, to be analyzed for the cabezon stock in waters off California (Table 2-1) for 2007 and 2008. This is the same as the status quo OY alternative. The ABC alternative identified for analysis is 94 mt for both 2007 and 2008; this alternative is based on the sum of average 2007-2008 ABCs for the northern and southern substocks (north and south of Pt. Conception), as determined in the 2005 stock assessment.

Pacific Whiting

Pacific whiting are managed based on an annual assessment prepared jointly by U.S. and Canadian scientists. Pacific whiting harvest specifications are based on annual assessments and are only analyzed in this EIS to understand the potential bycatch implications of future whiting fisheries. The 2007 ABC and OY will be adopted by the Council at its March 2007 meeting. As placeholders, the Council specified a range of coastwide ABC and OY alternatives for analysis as follows: an OY range of 134,534 mt to 403,604 mt (Table 2-1). This compares to the status quo U.S. OY of 269,069 mt for 2006. The range of 2007 and 2008 ABC alternatives specified for analysis are 244,425 mt to 733,275 mt. The status quo 2006 ABC is 488,850 mt.

Petrale Sole

Three 2007-2008 OY alternatives for petrale sole (coastwide) have been analyzed for Council decision: 1,921 mt, 2,499 mt, and 2,883 mt (Table 2-1). This compares to the status quo OY of 2,762 mt in 2005 and 2006. The OYs are also subdivided by INPFC regions (Columbia and US-Vancouver areas and Eureka, Monterey, and Conception areas) and by latitude (north and south of 40°10' N latitude).

The OY alternatives for the Columbia and US-Vancouver areas were identified by applying the following rationale: OY Alternative 1 is based on the low spawning biomass model from the 2005 stock assessment {Lai et al. 2005}; OY Alternatives 2 and 3 are the same, and are the result of a reduction from the ABC using the 40-10 rule. The ABC alternatives identified for analysis are 2,917 mt for 2007 and 2,919 mt for 2008. Using results from the 2005 stock assessment, each ABC was calculated by summing the north ABC and the south ABC/OY.

Sablefish

The Council identified the following alternatives to be analyzed for the coastwide sablefish stock (Table 2-1): 4,574 mt and 5,934 mt. This compares to the status quo OY of 7,761 mt in 2005 and 7,634 mt in 2006. 2007 and 2008 ABCs identified for analysis are 6,210 mt and 6,058 mt, respectively. OY Alternative 1 is calculated by applying the 40-10 adjustment to the ABC derived from the low stock/production model in the 2005 sablefish assessment {Schirripa and Colbert 2005}; OY Alternative 2 is calculated by applying the 40-10 adjustment using the assessment's base case model.

Each coastwide OY alternative is also divided north and south of 36^{o} N latitude using status quo proportions. Alternative methods for apportioning the OY were not considered because the STAR Panel {Barnes et al. 2005} recommended calculating coastwide biomass without including Conception area survey data.

2.1.3 Healthy Groundfish Species

Arrowtooth Flounder

As arrowtooth flounder is a healthy stock, the Council has identified a single ABC/OY alternative, 5,800 mt, to be analyzed (Table 2-1). This is the same as the status quo ABC/OY for 2005 and 2006; the stock has not been assessed since the previous harvest specifications process, and therefore there is no basis for identifying a value other than that of the status quo.

Black Rockfish (in Waters off Oregon and California)

The Council has specified one OY alternative for analysis for the black rockfish stock in waters off Oregon and California, 722 mt (Table 2-1), based on a projection from the base model in the 2003 assessment {Ralston 2003}. These projected ABCs (725 mt in 2007 and 719 mt in 2008) were averaged and specified for each year (722 mt). Since this is a healthy stock with a spawning biomass above $B_{40\%}$, the OYs were set equal to the ABC. This compares to the status quo OYs of 753 mt in 2005 and 736 mt in 2006, both of which had been set equal to the ABC for that year. Management of the southern black rockfish stock is divided at the California/Oregon border.

Black Rockfish (in Waters off Washington)

The northern black rockfish stock in waters off Washington is healthy. Therefore, the Council has identified a single ABC/OY alternative, 540 mt, to be analyzed (Table 2-1). This is the same as the status quo ABC/OY for 2005 and 2006 since the stock has not been assessed since the previous harvest specifications process; therefore, there is no basis for selecting a value other than the status quo. This value is based on 88% of the northern ABC for the assessed stock north of Cape Falcon, Oregon.

California Scorpionfish

California scorpionfish was first assessed in 2005 {Maunder et al. 2006}, and therefore 2007 will be the first year in which it is not managed as part of the Minor Nearshore Rockfish South complex and the first time that the Council adopts an ABC and an OY for the stock. The Council has specified two

ABC/OY alternatives for analysis: 137 mt and 219 mt (Table 2-1). The first alternative, 137 mt, was derived using the recreational portion from the ABC/OY (based on the 2007-2008 average), multiplying it by 53%, dividing it by 88%, and then adding this modified value to the commercial portion of the ABC/OY (based on the 2007-2008 average). The second alternative provides an ABC/OY of 219 mt based on an average of the 2007 and 2008 ABC/OYs from the stock assessment {Maunder et al. 2005}.

The GMT recommends OY Alternative 1 (137 mt) a modified ABC/OY. This approach utilizes the full recreational data in determining the OY and allows California to track catches inseason with the CRFS program. By incorporating the ability to make inseason adjustments, the risk of either not achieving or overshooting the OY is reduced. The GMT refers the Council to "CDFG Draft Report on Background Information for Selection of 2007/2008 OYs for Gopher Rockfish, California Scorpionfish and Minor Nearshore Rockfish" for further explanation of the calculation of this OY Alternative.

Chilipepper Rockfish

The Council has specified status quo alternatives for chilipepper rockfish for 2007 and 2008 ABCs and OYs, as there is no new stock assessment from which to base new harvest specifications. These alternatives are an ABC of 2,700 mt and an OY of 2,000 mt for 2007-2008 (Table 2-1). The lower OY alternative is a precautionary specification to control the bycatch of bocaccio. The higher OY alternative equals the status quo ABC, since the stock is considered healthy. The rationale for considering this alternative is depth-based management may be an adequate bocaccio bycatch control mechanism.

Chilipepper rockfish within the Eureka INPFC region are managed within the Minor Rockfish North category, and therefore are not included within the ABC and OY alternative values.

Dover Sole

The OY alternatives specified for analysis for Dover sole stock are 16,500 mt and 28,482 mt (Table 2-1). This compares to the status quo OYs of 7,476 mt in 2005 and 7,564 mt in 2007. The first OY alternative is equal to the equilibrium MSY from the 2005 stock assessment {Sampson 2005}; the second alternative is set to the ABC alternative. The Council identified an ABC alternative of 28,522 mt for 2007 and 28,442 mt for 2008. These ABCs were calculated using the $F_{40\%}$ proxy harvest rate and represent the combined total of the south and the north portions of the stock.

English Sole

The OY alternative specified for analysis for English sole stock is 6,237 mt (Table 2-1). This compares to the status quo OY of 3,100 mt for 2005 and 2006. The Council identified an ABC alternative of 6,773 mt for 2007 and 5,701 mt for 2008. The OY alternative was determined by averaging of the 2007 and 2008 ABC alternatives. Projections from the 2005 stock assessment of English sole {Stewart 2005} were used to identify the ABC alternatives.

Lingcod

The OY alternatives specified for analysis for lingcod are 6,280 mt and 6,088 mt (Table 2-1). This compares to the status quo OY of 2,414 mt for 2005 and 2006; these 2005-2006 specifications were adopted by the Council with the lingcod rebuilding plan prior to the stock being declared rebuilt from its overfished status in November 2005. The first alternative was calculated by setting the OY equal to the coastwide ABC, as lingcod is a healthy stock. The second alternative is the sum of LCN and LCS (northern and southern lingcod substocks) OYs; the LCS OY was derived using a 40-10 adjustment. The OYs are also subdivided by INPFC regions (Columbia and US-Vancouver areas and Eureka, Monterey, and Conception areas) and by latitude (North of 42° and South of 42 °). The Council's specified ABC alternatives for 2007 and 2008 are 6,706 mt and 5,853 mt, respectively.

Longspine Thornyhead

The OY alternatives specified for analysis for longspine thornyhead are 2,696 mt and 3,930 mt (Table 2-1). This compares to the status quo OY of 2,656 mt for 2005 and 2006. The first alternative, 2,696 mt, is based on assuming constant density throughout the Conception area and the proportion of the area north and south of Pt. Conception (21% of the Conception area) with a 25% precautionary reduction. The second alternative, 3,930 mt, is based on assuming constant density throughout the Conception area and the proportion of the area north and south of Pt. Conception (21% of the Conception area). As a healthy stock, the OY can be set equal to the ABC, which is how the second alternative was calculated. The OYs are also subdivided by latitude based on a GMT-recommended alternative where harvest guidelines north and south of 34°27' N latitude are analyzed. However the status quo alternative OYs for 2005 and 2006 were specified north and south of 36° N latitude. The Council's specified ABC alternatives for 2007 and 2008 are 3,953 mt and 3,860 mt, respectively.

Shortbelly Rockfish

Shortbelly rockfish is unexploited due to its small size, except as infrequent incidental catch. The 13,900 mt ABC/OY is a continuation of a conservative Council policy for this species based on its last assessment in 1989. Since that assessment, the peak one-year shortbelly landings have been <100 mt.

Shortspine Thornyhead

The shortspine thornyhead OY alternatives specified for analysis are 1,661 mt and 2,476 mt (Table 2-1). This compares to the status quo OY of 1,055 mt for 2005 and 1,077 mt for 2006. The coastwide OYs are the sum of OYs determined for north and south of Pt. Conception (34°27' N latitude). The Council's specified ABC alternatives for 2007 and 2008 are 2,488 mt and 2,463 mt, respectively.

For alternative 1, the OY for the area south of Pt. Conception is based on the base case assessment scenario in the 2005 stock assessment {Hamel 2005}, which indicated that 34% of the coastwide biomass is in this area, and with a 50% reduction to account for the paucity of survey data south of Pt. Conception. The 50% reduction is due to the SSC conclusion the assessment is marginally sufficient to estimate resource status given the short duration and density of survey data south of Pt. Conception. The base case model assumed h = 0.6 and q = 1.0. The OY alternative 1 for the area north of Pt. Conception based on the base case assessment result indicating 66% of the coastwide biomass is in this area with a 25% precautionary reduction. The 25% precautionary reduction is due to the SSC conclusion the assessment is marginally sufficient to estimate resource status. The base case model assumed h = 0.6 and q = 1.0.

Alternative 2 OYs (for north and south of 34°27' N latitude) are based on the same biomass estimates from the 2005 stock assessment base case model, but with no precautionary reduction. Therefore, the OY alternative for the area south of Pt. Conception (841 mt) is based on an estimate of 34% coastwide biomass is in this area and the OY alternative for the north portion (1,634 mt) is based on an estimate of the remaining 66% of the coastwide biomass.

Splitnose Rockfish

As in 2005-2006, the ABC of 615 mt is reduced to an OY of 461 mt based on the Council's policy of making a 25% precautionary OY adjustment for species with less rigorous stock assessments. These harvest specifications are for south of 40°10' N latitude since splitnose rockfish are managed as part of the northern minor slope rockfish complex north of 40°10' N latitude.

Starry Flounder

Starry flounder was assessed for the first time in 2005 and is now proposed to be managed with a separate ABC and OY. Previously the stock has been managed as a component stock of the Other Flatfish complex. Therefore, there are no status quo ABC or OY alternatives for the stock. The Council requested the following two OY alternatives for analysis: 890 mt and 1,186 mt (Table 2-1). Alternative 1 (890 mt) is based on a 25% reduction of the combined area OYs from the base model in the stock assessment {Ralston 2005} as a result of the 25% precautionary reduction for data poor stocks. Alternative OY 2 (1,186 mt) is based on the combined area OYs from the based model in the stock assessment. The ABC alternatives identified by the Council are 1,221 mt for 2007 and 1,395 mt for 2008.

Yellowtail Rockfish

Yellowtail rockfish is a healthy rockfish stock that had a new stock assessment in 2005{Lai 2006}. Year-specific ABCs were projected following the Council's policy of using an $F_{50\%}$ harvest rate as a proxy for F_{MSY} for rockfish; the 2007 ABC for this species is 4,585 mt and the 2008 ABC is 4,510 mt. These ABCs were averaged (4,548 mt) and specified for both years. The OYs were set equal to ABC because the stock is above $B_{40\%}$. The GMT notes that the fisheries have not been attaining yellowtail rockfish harvest levels in recent years because its harvest has been constrained to protect co-occurring depleted species.

2.1.4 Unassessed Groundfish Species and Those Managed as Part of a Stock Complex

2.1.4.1 Minor Rockfish South

The Council has identified four minor rockfish south OY alternatives for analysis: 1,753 mt, 1,855 mt, 1,898 mt, and 2,006 mt (Table 2-1). The OY alternatives calculated for nearshore species, shelf species, and slope species sum to equal the overall minor rockfish south value. The overall OY alternatives for 2007-2008 compare to the status quo OY of 1,968 mt.

The ABC alternative identified by the Council for analysis is 3,403 mt; this compares to a status quo ABC alternative of 3,412 mt for 2005 and 2006. The ABC alternative for 2007 and 2008 reflects three adjustments to account for the reassessment of blackgill rockfish and the new assessments for gopher rockfish and California scorpionfish. First, the status quo contribution of blackgill rockfish to the ABC (343 mt) was removed from the complex ABC and replaced with the new blackgill ABC/OY of 292 mt (based on the 2007-2008 average ABC/OY); this results in an overall reduction of 51 mt. Second, the status quo contribution of gopher rockfish (97 mt) was removed and replaced with the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY), resulting in an overall increase of 205 mt. Third, the status quo contribution of California scorpionfish (163 mt) was removed from the ABC as this species will now be managed under its own ABC/OY.

Minor Nearshore Rockfish Species

The complex, Minor Nearshore Rockfish south of 40°10' N latitude, is further subdivided into the following management categories: 1) shallow nearshore rockfish [comprised of black and yellow rockfish (*S. chrysomelas*); China rockfish (*S. nebulosus*); gopher rockfish (*S. carnatus*); grass rockfish (*S. rastrelliger*), and kelp rockfish (*S. atrovirens*)]; 2) deeper nearshore rockfish: [comprised of black rockfish (*S. melanops*), blue rockfish (*S. mystinus*); brown rockfish (*S. auriculatus*); calico rockfish (*S. dalli*); copper rockfish (*S. caurinus*); olive rockfish (*S. serranoides*); quillback rockfish (*S. maliger*); and treefish (*S. serriceps*)] and 3) California scorpionfish (*Scorpaena guttata*).

The Council adopted a southern minor nearshore rockfish species OY for 2003 of 541 mt. This OY was based upon the Groundfish FMP policy for specifying OYs for unassessed species using 50% of recent landings, and was recalculated from the 2001-2002 OY of 662 mt using updates estimates of recreational and commercial harvest. For the 2004 southern minor nearshore rockfish species OY, an adjustment was made to account for removal of black rockfish; however this adjustment started with the 2002 OY of 662 mt and not the 2003 OY of 541 mt. The resulting OY of 615 mt was adopted by the Council for 2004 for the 2005-2006 management cycles. For the 2007-2008 management cycle, the Minor Nearshore Rockfish South is corrected by subtracting the black rockfish OY of 47 mt from the 541 mt OY, resulting in a value of 494 mt.

This initial value for the southern minor nearshore rockfish species OY is then adjusted to account for the new California scorpionfish and gopher rockfish assessments. The current contribution for California scorpionfish of 81.5 mt is removed from the combined OY. Because gopher rockfish cannot be managed separately from other nearshore rockfish species without significantly increasing bycatch and because of uncertainty regarding the assessment because of its poor data quality, gopher rockfish will remain in the southern minor nearshore rockfish species OY and will have a point of concern set at a level determined appropriate to the adopted OY. The following four alternatives different methods for accounting for these changes.

The 413 mt OY alternative includes the 48.5 mt contribution of gopher rockfish (494 mt minus the California scorpionfish contribution of 81.5 mt equals 413 mt). OY alternative 2 is determined by removing the current contribution for gopher rockfish (48.5 mt) from the OY and then increasing the OY by 50% of the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY; 2007 = 340 mt, 2008 = 264 mt); this calculation leads to a value of 515 mt. The 558 mt OY alternative is determined by removing the current contribution for gopher rockfish (48.5 mt) from the OY and then increasing the OY by 75% of the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY; 2007 = 340 mt, 2008 = 264 mt). OY alternative 4 is determined by removing the current contribution for gopher rockfish (48.5 mt) from the OY and then increasing the OY by the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY; 2007 = 340 mt, 2008 = 264 mt); this calculation leads to an OY value of 666 mt. These four OY alternatives compare to the status quo OY alternative of 615 mt for 2004-2005, for which the calculation is discussed earlier.

Minor Shelf Rockfish Species

The minor shelf rockfish complex south of 40°10' N latitude is composed of the following species: bronzespotted rockfish (*S. gilli*); chameleon rockfish (*S. phillipsi*); dusky rockfish (*S. ciliatus*); dwarf-red rockfish (*S. rufianus*); flag rockfish (*S. rubrivinctus*); freckled rockfish (*S. lentiginosus*); greenblotched rockfish (*S. rosenblatti*); greenspotted rockfish (*S. chlorostictus*); greenstriped rockfish (*S. elongatus*); halfbanded rockfish (*S. semicinctus*); harlequin rockfish (*S. variegatus*); honeycomb rockfish (*S. umbrosus*); Mexican rockfish (*S. macdonaldi*); pink rockfish (*S. eos*); pinkrose rockfish (*S.

simulator); pygmy rockfish (*S. wilsoni*); redstripe rockfish (*S. proriger*); rosethorn rockfish (*S. helvomaculatus*); rosy rockfish (*S. rosaceus*); silvergray rockfish (*S. brevispinis*); speckled rockfish (*S. ovalis*); squarespot rockfish (*S. hopkinsi*); starry rockfish (*S. constellatus*); stripetail rockfish (*S. saxicola*); swordspine rockfish (*S. ensifer*); tiger rockfish (*S. nigrocinctus*); vermilion rockfish (*S. miniatus*); and yellowtail rockfish (*S. flavidus*).

The Council has identified the status quo ABC and OY as the only alternative to be analyzed for 2007-2008 management cycle. The OY is set to the ABC; therefore, the ABC alternative and OY alternative for analysis are both 714 mt.

Minor Slope Rockfish Species

The minor slope rockfish complex south of 40°10' N latitude is composed of the following species: aurora rockfish (*S. aurora*); bank rockfish (*S. rufus*); blackgill rockfish (*S. melanostomus*); Pacific ocean perch (*S. alutus*); redbanded rockfish (*S. babcocki*); rougheye rockfish (*S. aleutianus*); sharpchin rockfish (*S. zacentrus*); shortraker rockfish (*S. borealis*); and yellowmouth rockfish (*S. reedi*).

The Council identified one ABC/OY alternative for this complex: 626 mt. This value was determined by the following calculation: the status quo contribution of blackgill (305 mt) was removed from the complex and replaced with the new blackgill ABC/OY of 292 mt (based on the 2007-2008 average ABC/OY; 2007 = 294 mt, 2008 = 290 mt). This alternative compares to the status quo alternative ABC/OY of 639 mt.

2.1.4.2 Minor Rockfish North

The Council has identified three minor rockfish north OY alternatives for analysis: 2,250 mt, 2,270 mt, and 2,290 mt (Table 2-1). The OY alternatives calculated for nearshore species, shelf species, and slope species sum to equal the overall minor rockfish north values. The overall OY alternatives for 2007-2008 compare to the status quo OY of 2,250 mt. The Council identified the status quo ABC alternative, 3,680 mt, to be evaluated for the 2007-2008 management cycle.

Minor Nearshore Rockfish Species

The minor nearshore rockfish complex north of 40°10' N latitude is composed of the following species: black and yellow rockfish (*S. chrysomelas*); blue rockfish (*S. mystinus*); brown rockfish (*S. auriculatus*); calico rockfish (*S. dalli*); China rockfish (*S. nebulosus*); copper rockfish (*S. caurinus*); gopher rockfish (*S. carnatus*); grass rockfish (*S. rastrelliger*); kelp rockfish (*S. atrovirens*); olive rockfish (*S. serranoides*); quillback rockfish (*S. maliger*); and treefish (*S. serriceps*).

When black rockfish was originally removed from the northern minor nearshore rockfish OY, a ratio of black to blue rockfish catch was used to determine what proportion of that OY was attributable to black rockfish. However, due to the variability of blue rockfish catches, there is some concern that this ratio (92%:8% black to blue rockfish) under-represents blue rockfish catch and therefore the resulting OY (since black rockfish is managed separately). To account for this uncertainty (that is, a range of possible levels of black rockfish removal from the OY), three alternatives have been identified by the Council. OY alternative 1 is equal to the status quo OY alternative of 122 mt. OY alternative 2 (142 mt) is equal to the status quo OY alternative plus 20 mt. OY alternative 3 (162 mt) is equal to the status quo OY alternative plus 40 mt.

Minor Shelf Rockfish Species

The minor shelf rockfish complex north of 40°10' N latitude is composed of the following species: bronzespotted rockfish (*S. gilli*); bocaccio (*Sebastes paucispinis*); chameleon rockfish (*S. phillipsi*); chilipepper rockfish (*S. goodei*); cowcod (*S. levis*); dusky rockfish (*S. ciliatus*); dwarf-red rockfish (*S. rufianus*); flag rockfish (*S. rubrivinctus*); freckled rockfish (*S. lentiginosus*); greenblotched rockfish (*S. rosenblatti*); greenspotted rockfish (*S. chlorostictus*); greenstriped rockfish (*S. elongatus*); halfbanded rockfish (*S. semicinctus*); harlequin rockfish (*S. variegatus*); honeycomb rockfish (*S. umbrosus*); Mexican rockfish (*S. macdonaldi*); pink rockfish (*S. eos*); pinkrose rockfish (*S. simulator*); pygmy rockfish (*S. wilsoni*); redstripe rockfish (*S. proriger*); rosethorn rockfish (*S. helvomaculatus*); rosy rockfish (*S. rosaceus*); silvergray rockfish (*S. brevispinis*); speckled rockfish (*S. ovalis*); squarespot rockfish (*S. hopkinsi*); starry rockfish (*S. constellatus*); stripetail rockfish (*S. saxicola*); swordspine rockfish (*S. ensifer*); tiger rockfish (*S. nigrocinctus*); and vermilion rockfish (*S. miniatus*).

No change from status quo was identified by the Council for analysis; therefore the status quo ABC/OY alternative for northern minor shelf rockfish species, 968 mt, is analyzed for the 2007-2008 management cycle (Table 2-1).

Minor Slope Rockfish Species

The minor slope rockfish complex north of 40°10' N latitude is composed of the following species: aurora rockfish (*S. aurora*); bank rockfish (*S. rufus*); blackgill rockfish (*S. melanostomus*); redbanded rockfish (*S. babcocki*); rougheye rockfish (*S. aleutianus*); sharpchin rockfish (*S. zacentrus*); shortraker rockfish (*S. borealis*); splitnose rockfish (*S. diploproa*); and yellowmouth rockfish (*S. reedi*).

No change from status quo is identified by the Council for analysis; therefore the status quo ABC/OY alternative for northern minor slope rockfish species, 1,160 mt, is analyzed for the 2007-2008 management cycle (Table 2-1).

2.1.4.3 Other Unassessed Species

Pacific Cod

No change from status quo is identified by the Council for analysis. As in 2005-2006, the Pacific cod ABC of 3,200 mt is based on historic landings levels, with the 1,600 mt OY representing the Council’s precautionary 50% adjustment for unassessed species (Table 2-1).

Other Fish

The Other Fish stock complex contains all the unassessed Groundfish FMP species that are neither rockfish (family *Scorpaenidae*) nor flatfish. These species include big skate (*Raja binoculata*), California skate (*Raja inornata*), leopard shark (*Triakis semifasciata*), longnose skate (*Raja rhina*), soupfin shark (*Galeorhinus zyopterus*), spiny dogfish (*Squalus acanthias*), finescale codling (*Antimora microlepis*), Pacific rattail (*Coryphaenoides acrolepis*), ratfish (*Hydrolagus colliei*), cabezon (*Scorpaenichthys marmoratus*) (north of the California-Oregon border at 42° N latitude), and kelp greenling (*Hexagrammos decagrammus*).

No change from status quo is identified by the Council for analysis. The OY alternative is 7,300 mt and the ABC alternative is 14,600 mt (Table 2-1).

Other Flatfish

The Other Flatfish complex contains all the unassessed flatfish species in the Groundfish FMP. These species include butter sole (*Isopsetta isolepis*), curlfin sole (*Pleuronichthys decurrens*), flathead sole (*Hippoglossoides elassodon*), Pacific sanddab (*Citharichthys sordidus*), rex sole (*Glyptocephalus zachirus*), rock sole (*Lepidopsetta bilineata*), and sand sole (*Psettichthys melanostictus*).

The Council has identified an OY alternative of 4,884 mt to be analyzed. This OY is based on the ABC with a 25% precautionary reduction for sanddabs and rex sole and a 50% precautionary reduction for the remaining species. The starry flounder contribution is removed (25 mt). The status quo OY alternative is 4,909 mt for 2005 and 2006.

The Council has identified an ABC alternative of 6,731 mt to be analyzed for 2007 and 2008. This ABC alternative is based on the following historical catch levels: the highest landings of Pacific sanddabs (in 1995) and rex sole (in 1982) for the 1981-2003 period and on average landings during 1994-1998 for the remaining Other Flatfish species. The starry flounder contribution is removed (50 mt). The status quo ABC alternative is 6,781 mt for 2005 and 2006.

2.1.5 Alternative Harvest Levels Considered, But Eliminated From Detailed Study

The new darkblotched rebuilding analysis indicates some otherwise viable OY alternatives exceed the ABC, which is based on a proxy F_{MSY} harvest rate. However, a stock's OY cannot legally exceed the ABC, which for darkblotched is 456 mt and 486 mt in 2007 and 2008, respectively. Therefore, OY Alt. 5 (472 mt) can only be considered in 2008 as a year-specific OY. Since the Council intends to average the darkblotched OY from rebuilding analysis projections and specify the same average OY for 2007 and 2008, OY Alternative 5 is eliminated from detailed study.

Yelloweye OY Alternatives specified by the Council in November 2005 for analysis were based on the 2005 rebuilding analysis by Tsou and Wallace (2005)[1]. However, a new yelloweye assessment and rebuilding analysis were adopted as the best available science by the Council in 2006. The new rebuilding analysis {Tsou and Wallace 2006} indicates a 2007-2008 OY ≥ 15 mt for yelloweye would result in a less than a 50% probability of rebuilding by T_{MAX}, which is not legally viable. Therefore, OY Alternatives 3-6 under a constant harvest rate rebuilding strategy are eliminated from further study in this EIS.

2.2 Alternative Management Measures

2.2.1 Catch Sharing Options

2.2.1.1 Research Catches

Under the Magnuson-Stevens Act and the Pacific Coast Groundfish FMP, the term fishing refers to the catching, taking, or harvesting of fish; the attempted catching, taking, or harvesting of fish; any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or any

1 Since the 2005 yelloweye assessment (Wallace et al. 2005) and rebuilding analysis (Tsou and Wallace 2005) were superseded by the 2006 assessment (Wallace et al. 2006) and rebuilding analysis (Tsou and Wallace 2006), they were not published in a Stock Assessment and Fishery Evaluation document. However, these documents are posted on the Council's web site at pcouncil.org for those who are interested.

operations at sea in support of, or in preparation for the catching, taking, or harvesting of fish. Activity by a vessel conducting authorized scientific research is not considered fishing under the Magnuson-Stevens Act or the Pacific Coast Groundfish FMP. However, nothing within the Magnuson-Stevens Act or the Pacific Coast Groundfish FMP is intended to inhibit or prevent any scientific research activity conducted by a scientific research vessel.

The federal regulations, § 600.310 (f)(4)(iii) require that fishing mortality be counted against the OY, including that resulting from bycatch, scientific research, and other fishing activities. In past years, prior to the establishing harvest guidelines for fishing activities, the Council has set aside a portion of the OY for each stock of stock complex projected to be taken by vessels conducting scientific research. The projected amounts were based on the most recent years' research catch summaries and were modified to account for changes in research activities between years. Because the research catch amounts are projections, the catch levels have on occasion been modified during the year when the catch of a constraining overfished species was higher than originally projected.

Table 2-4 summarizes the scientific research catch for 2005. Research catch projections for the overfished species are presented in the estimated mortality impact tables (i.e., bycatch scorecards) that have been prepared for each alternative. For 2007 and 2008, the depleted species' research catch projections are held constant under the different alternatives with the exception of yelloweye rockfish. Yelloweye rockfish values are increased over previous years in response to an increase in survey stations in the IPHC's annual Pacific Halibut longline survey. The additional survey stations are in yelloweye rockfish habitat and are expected to provide much needed fishery independent biological data on yelloweye. However, under the Preferred Low OY alternatives for depleted species, the new IPHC survey stations are not included. The values for bocaccio, widow and canary rockfish are based on the summary of research catch in 2005. These values were rounded up given the understanding that the biomass levels for these stocks are increasing and therefore, they will be more likely to be taken in research catches. Cowcod projections are also based on the summary of 2005 research catch. Although the total research catch in 2005 for darkblotched rockfish and POP was lower than originally projected, the research catch amounts for 2007 and 2008 are the same as those set aside at the beginning of 2005. The catch of these species varies considerably between years (darkblotched rockfish: 5.14 mt in 2003, 0.08 in 2004, and 2.08 mt in 2005; POP: 5.0 mt in 2003, 0.35 mt in 2004, 1.84 mt in 2005). In addition, the biomass levels for these stocks are increasing and they are more likely to be taken in research catches.

2.2.1.2 Exempted Fishing Permit Catches

This section will be completed after 2007 EFP applications are received by the Council in June 2006, at which time the Council may decide to specify EFP bycatch caps or a set-aside yield of groundfish species to allow 2007 EFPs to proceed.

2.2.2 New Management Lines

New management lines being considered for 2007-2008 include a 10 fm line in Washington to manage recreational fisheries, a 20 fm line in Washington and Oregon for managing recreational and nearshore commercial fisheries[2], a 25 fm line in Washington Marine Areas 1 and 2 (from the Oregon/Washington border to the Queets River) for managing the Washington recreational fishery, a 180 fm line modified for petrale sole fishing areas in California (south of 42º N latitude to US/Mexico border) to provide for winter petrale fishing, a 250 fm line south of 38º N latitude for use in managing commercial slope fisheries, and an accompanying 250 fm line modified for petrale sole fishing areas south of 38º N latitude.

The Oregon Department of Fish and Wildlife is proposing a 25 fm RCA line for Council adoption. This line would replace the current 27 fm RCA line in regulation. Due to the geography of the coast, and the methods by which these lines were drawn, there is little difference in area between the 25 fm RCA line and the 27 fm RCA line. This would, however, provide consistency in groundfish regulations between Washington and Oregon, as there would be a continuous 25 fm RCA line beginning at the Queets River and continuing to the Oregon/California border, thus simplifying regulations and providing RCA line consistency to the fishing community.

Additionally, the GMT intends to review the existing petrale sole fishing areas used to manage limited entry trawl fisheries during periods 1 and 6 and may recommend modifications to the boundaries defining these Groundfish Fishing Areas. Any coordinates defining new management lines are anticipated to be provided at the June 2006 Council meeting in Foster City, California.

2 The new 20 fm line in Washington and Oregon is expected to be formally defined with waypoints for 2007-2008 to better enforce any 20 fm depth restriction that might be implemented. California has been managing their recreational and nearshore commercial fisheries with a 20 fm depth restriction regionally, but this regulation is specified referencing depth contours rather than a defined line using latitude/longitude coordinates or waypoints. This was adopted because the majority of the 20 fm depth contour is within state waters, with the exception of an area off of San Francisco over sandy habitat where depleted rockfish (e.g., bocaccio) are not expected to be encountered. This nearshore depth contour winds along a rugged coastline and is considered by CDFG enforcement to be more successfully enforced as a depth contour. Therefore, CDFG intends to continue managing the 20 fm depth restriction by contours.

Table 2-4. Summary of total catch (mt) data from scientific fishing in 2005.

Species	Post-capture behavior and mortality of important bycatch species	Ultrasonic camera examinations of interactions between groundfish and fishing gear	Northwest Fisheries Science Center to conduct a pre-recruit hake survey	Northwest Fisheries Science Center annual bottom trawl survey	U.S. – Canada Joint Pacific Hake Echo Integration Trawl Survey	Northwest Fisheries Science Center integrated study of the ecology of pre-recruit fish	International Pacific Halibut Commission - Pacific Halibut Longline Survey	Pacific Coast Groundfish Conservation Trust - Canary Rockfish Survey	**Total (mt)**
ROUNDFISH:									
Lingcod			0.00	4.00	0.01		0.22	0.20	**4.54**
Pacific Cod				0.21	0.00		0.02		**0.23**
Pacific Whiting		1.77	0.06	15.41	43.58	0.00	0.05		**60.86**
Sablefish N. of 36° N. lat.	0.00	0.76	0.00	7.56			7.24		**15.56**
Sablefish S. of 36° N. lat.				2.17					**2.17**
Cabezon			0.00	0.00					**0.00**
FLATFISH:									
Dover Sole		1.71		28.12	0.00				**29.83**
English Sole	0.00			4.39					**4.39**
Petrale Sole				3.51					**3.51**
Arrowtooth Flounder		0.52		5.47	0.01		0.05	0.00	**6.05**
Other Flatfish	0.01	0.17	0.00	13.28		0.01	0.01		**13.48**
ROCKFISH:									
Pacific Ocean Perch		0.02		1.26	0.56				**1.84**
Shortbelly			0.00	8.20	0.01				**8.21**
Widow			0.00	0.19	0.85	0.00		0.00	**1.11**
Canary			0.00	1.47	0.01	0.00	0.02	0.79	**2.32**
Chilipepper (South)			0.00	13.07	0.19				**13.37**
Bocaccio (South)				0.40	0.00			0.01	**1.69**
Splitnose (South)				2.68	1.63				**4.31**
Yellowtail (North)			0.00	3.23	1.35		0.01	0.14	**4.73**
Shortspine Thornyhead		0.87		3.81			0.01		**4.68**
Longspine Thornyhead N. of 36° N. lat.				9.40					**9.40**
Longspine Thornyhead S. of 36° N. lat.				0.94					**0.94**
Cowcod - Conception				0.01					**0.08**
Cowcod - Monterey				0.02					**0.02**
Darkblotched		0.02	0.00	2.05	0.01	0.00	0.00		**2.08**
Yelloweye				0.07			0.47	0.11	**0.64**
Black Rockfish			0.00	0.00	0.01		0.00	0.00	**0.01**

Table 2-4. Summary of total catch (mt) data from scientific fishing in 2005 (continued).

Species	Post-capture behavior and mortality of important bycatch species	Ultrasonic camera examinations of interactions between groundfish and fishing gear	Northwest Fisheries Science Center to conduct a pre-recruit hake survey	Northwest Fisheries Science Center annual bottom trawl survey	U.S. – Canada Joint Pacific Hake Echo Integration Trawl Survey	Northwest Fisheries Science Center integrated study of the ecology of pre-recruit fish	International Pacific Halibut Commission - Pacific Halibut Longline Survey	Pacific Coast Groundfish Conservation Trust - Canary Rockfish Survey	**Total (mt)**
MINOR ROCKFISH NORTH				10.68	0.03				**10.71**
Remaining Rockfish North				6.61					**6.61**
Bocaccio			0.00	0.02	0.02		0.00	0.02	**0.07**
Chilipepper				1.12	0.05				**1.18**
Redstripe		0.00		0.06	0.10	0.00		0.01	**0.17**
Sharpchin			0.00	3.04					**3.04**
Silvergrey				0.10	0.03		0.00		**0.13**
Splitnose		0.53		2.24					**2.77**
Yellowmouth				0.04	0.57		0.00		**0.60**
Other Rockfish North		0.17	0.00	4.06			0.22	0.05	**4.50**
MINOR ROCKFISH SOUTH				8.11					**10.38**
Remaining Rockfish South				0.35					**0.53**
Bank				0.02					**0.06**
Blackgill				0.26					**0.27**
Sharpchin				0.00					**0.00**
Yellowtail				0.07				0.24	**0.44**
Other Rockfish South				7.76					**9.66**
Unidentifiable Rockfish						0.01			**0.01**
SHARKS/SKATES/RATFISH/GRENADIERS/KELP GREENLING									
Kelp Greenling				0.02					**0.02**
Spiny Dogfish		0.01	0.00	8.71	0.61	0.00	5.47		**14.81**
Other Groundfish		0.11		15.96	0.44		2.27	0.10	**18.88**

2.2.3 Description of the Management Measure Alternatives

2.2.3.1 The No Action Alternative

The No Action Alternative is described by the 2005 and 2006 management measures specified in federal and state regulations. All of the action alternatives described in this chapter will be compared to the No Action Alternative. Some of these management measures were changed beginning in 2006 in reaction to problems that arose in managing the 2005 fishery. While 2005 management measures, including inseason adjustments, will be described in detail, the 2006 management measures and projected impacts will be the central focus when comparing all action alternatives to the No Action Alternative. Projected impacts of depleted groundfish species under the No Action Alternative are depicted in Table 2-5.

Table 2-5. Projected mortality (mt) of depleted groundfish species by fishing sector in 2006.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	47.4	7.8	**2.7**	160.3	63.3	1.0	0.3
Limited Entry Trawl- Whiting							
At-sea whiting motherships				4.7	1.0		0.0
At-sea whiting cat-proc		4.7		6.3	2.9	200.0	0.0
Shoreside whiting				5.2	1.8		0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9
Open Access: Directed Groundfish	10.6	3.0	0.1	0.2	0.1	0.1	3.0
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.0	0.3	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish d/							
WA		8.5					6.7
OR						1.4	
CA	60.0	9.3	0.4			7.0	3.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	2.0	3.0	0.1	3.8	3.6	0.9	1.0
Non-EFP Total	134.7	44.3	3.4	181.9	73.7	257.3	20.3
EFPs e/							
CA early season whiting S. of 40°10'	0.3	0.1	0.0	0.2	0.0	0.4	0.0
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	134.7	44.3	3.4	181.9	73.7	257.3	20.3
2006 OY	**309**	**47.0**	**4.2**	**200**	**447**	**289**	**27**
Difference	174.3	2.7	0.8	18.2	373.3	31.7	6.7
Percent of OY	43.6%	94.2%	81.0%	90.9%	16.5%	89.0%	75.1%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish. This suggests that total bocaccio was caught in trace amounts.

d/ Values for canary and yelloweye rockfish represent specified harvest guidelines.

e/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

2.2.3.1.1 Limited Entry Trawl Fisheries

Non-Whiting Trawl Fishery

The 2006 trawl trip limits and seasonal RCA configurations (as of May 2006) describe the No Action Alternative and are shown in Tables 2-6a (north of 40°10' N latitude) and 2-6b (south of 40°10' N latitude).

A new management measure implemented in 2005 was mandating the use of selective flatfish trawls shoreward of the trawl RCA north of 40°10' N latitude. The selective flatfish trawl, configured with a cut-back headrope, a low rise, and a small (≤ 8 in. diameter) footrope, is designed to reduce rockfish bycatch while efficiently catching flatfish. The selective flatfish trawl works by allowing rockfish to escape by swimming upward when they encounter the trawl. Flatfish tend to dive down when disturbed, which accounts for the differential selectivity of these trawls to rockfish and flatfish.

In 2005 the non-whiting bottom trawl fishery was constrained with lower slope rockfish trip limits and a larger RCA with a seaward boundary of 200 fm north of 40°10' N latitude in response to a problem with early attainment of the darkblotched rockfish OY in 2004. The period 6 opportunity to harvest petrale sole was also lost in 2004 when the fishery was closed out to 250 fm to minimize further darkblotched rockfish impacts. One consequence of these 2004 management actions was a pent-up demand for petrale sole when the fishery re-opened in 2005. Coupled with this market demand, there was fair winter weather in the north and an abnormal distribution of petrale sole in 2005, which led to an early attainment and exceedance of the petrale sole OY. In response, there was a trip limit imposed on petrale sole in period 1 of 2006, which, in previous years, had been unlimited in periods 1 and 6. The more conservative slope rockfish trip limits and trawl RCA configuration were also re-specified for 2006 to avoid the darkblotched rockfish impacts observed in 2004. And, in a good faith effort to respond to the Ninth Circuit Court of Appeals ruling in a challenge to the darkblotched rockfish rebuilding plan (see section 1.3.1), the Council and NMFS adopted a lower 200 mt darkblotched rockfish OY for 2006 in an emergency rulemaking. This compares to the previously specified darkblotched rockfish OY of 294 mt.

Another change in limited entry trawl management measures from 2005 was the specification of cumulative trip limits for Pacific cod and spiny dogfish beginning in March 2006 (period 2). The Pacific cod ABC of 3,200 mt was based on historical landings since the stock has not been formally assessed. The Pacific cod OY was reduced by half from the ABC beginning in 2005 on the GMT's recommendation and in accordance with the precautionary policy for unassessed stocks {Restrepo et al. 1998 /ft "see FMP §4.6.2"}. In 2004, prior to the precautionary OY reduction, the total mortality of Pacific cod was greater than the current OY of 1,600 mt. Therefore, the Council and NMFS adopted a Pacific cod trip limit beginning in 2006 (Tables 2-6a and 2-6b); previously allowable landings were unlimited. A spiny dogfish trip limit was also specified beginning in 2006 to address conservation concerns and the depleted species' bycatch implications associated with targeting this stock in the open access fishery (see section 2.2.3.1.3 below for more details). Tables 2-6a and 2-6b depict the 2006 spiny dogfish trip limits.

Although not much bottom trawling is done south of Pt. Conception at 34°27' N latitude in the Southern California Bight, bottom trawling and other bottom fishing activities are prohibited in two discrete areas called the Cowcod Conservation Areas (Figure 2-3).

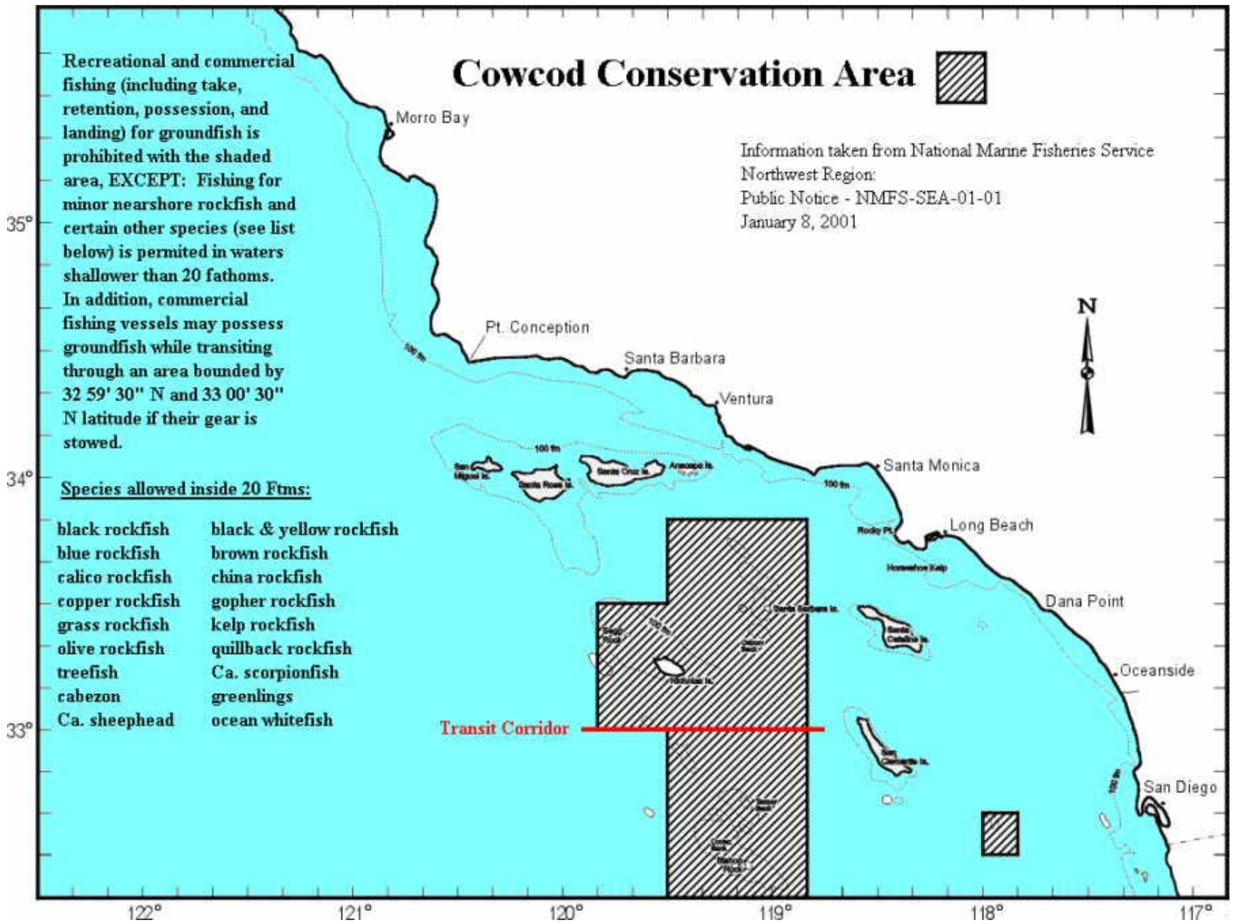


Figure 2-3. The current Cowcod Conservation Areas located in the Southern California Bight.

Whiting Trawl Fishery

The Pacific whiting OY of 269,069 mt, used to manage the 2005 and 2006 West Coast whiting fisheries, forms the basis for the No Action Alternative. The specific 2006 whiting harvest specifications are a coastwide (U.S. + Canada) ABC of 661,680 mt, a coastwide (U.S. + Canada) OY of 364,842 mt, and a U.S. OY of 269,069 mt. The U.S. OY of 269,069 mt is divided by first setting aside the tribal allocation

Table 2-6a. 2006 Trip limits for limited entry trawl gears north of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]: North of 40°10' N. lat.	75 fm - modified 200 fm [7/]		75 - 200 fm		100 - 200 fm	75 fm - 200 fm	75 fm - modified 200 fm [7/]
	Selective flatfish trawl gear is required shoreward of the RCA; all trawl gear (large footrope, selective flatfish trawl, and small footrope trawl gear) is permitted seaward of the RCA. Midwater trawl gear is permitted only for vessels participating in the primary whiting season.							
	See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).							
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.							
1	**Minor slope rockfish[2/] & Darkblotched rockfish**	2,000 lb/ month		4,000 lb/ 2 months				
2	**Pacific ocean perch**	1,500 lb/ month		3,000 lb/ 2 months				
3	**DTS complex**							
4	Sablefish							
5	large & small footrope gear	7,000 lb/ month		14,000 lb/ 2 months	20,000 lb/ 2 months			14,000 lb/ 2 months
6	selective flatfish trawl gear	2,500 lb/ month		7,000 lb/ 2 months	13,500 lb/ 2 months		7,000 lb/ 2 months	5,000 lb/ 2 months
7	multiple bottom trawl gear [8/]	2,500 lb/ month		7,000 lb/ 2 months	13,500 lb/ 2 months		7,000 lb/ 2 months	5,000 lb/ 2 months
8	Longspine thornyhead							
9	large & small footrope gear	7,500 lb/ month		15,000 lb/ 2 months	23,000 lb/ 2 months			15,000 lb/ 2 months
10	selective flatfish trawl gear	1,500 lb/ month		3,000 lb/ 2 months				
11	multiple bottom trawl gear [8/]	1,500 lb/ month		3,000 lb/ 2 months				
12	Shortspine thornyhead							
13	large & small footrope gear	2,000 lb/ month		4,000 lb/ 2 months	5,800 lb/ 2 months			4,000 lb/ 2 months
14	selective flatfish trawl gear	1,500 lb/ month		3,000 lb/ 2 months				
15	multiple bottom trawl gear [8/]	1,500 lb/ month		3,000 lb/ 2 months				
16	Dover sole							
17	large & small footrope gear	25,000 lb/ month		50,000 lb/ 2 months	35,000 lb/ 2 months			
18	selective flatfish trawl gear	10,000 lb/ month		28,000 lb/ 2 months				20,000 lb/ 2 months
19	multiple bottom trawl gear [8/]	10,000 lb/ month		28,000 lb/ 2 months				20,000 lb/ 2 months

Table 2-6a. 2006 Trip limits for limited entry trawl gears north of 40°10' N latitude (continued).

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:							
	North of 40°10' N. lat.	75 fm - modified 200 fm [7/]		75 - 200 fm		100 - 200 fm	75 fm - 200 fm	75 fm - modified 200 fm [7/]
20	**Flatfish** (except Dover sole)							
21	Other flatfish [3/], English sole & Petrale sole							
22	large & small footrope gear for Other flatfish[3/] & English sole	55,000 lb/ month		110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole.				110,000 lb/ 2 months
23	large & small footrope gear for Petrale sole	30,000 lb/ month						60,000 lb/ 2 months
24	selective flatfish trawl gear for Other flatfish[3/] & English sole	45,000 lb/ month		90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole.	90,000 lb/ 2 months, no more than 28,000 lb/ 2 months of which may be petrale sole.			90,000 lb/ 2 months
25	selective flatfish trawl gear for Petrale sole	12,500 lb/ month						25,000 lb/ 2 months
26	multiple bottom trawl gear [8/]	Other flatfish[3/] and English sole: 45,000 lb/ month Petrale sole: 12,500 lb/ month		90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole.	90,000 lb/ 2 months, no more than 28,000 lb/ 2 months of which may be petrale sole.			Other flatfish[3/] and English sole: 90,000 lb/ 2 months Petrale sole: 25,000 lb/ 2 months
27	Arrowtooth flounder							
28	large & small footrope gear	50,000 lb/ month		100,000 lb/ 2 months				
29	selective flatfish trawl gear	40,000 lb/ month		80,000 lb/ 2 months				
30	multiple bottom trawl gear [8/]	40,000 lb/ month		80,000 lb/ 2 months				
31	**Whiting**							
32	midwater trawl	Before the primary whiting season: CLOSED -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED						
33	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip -- During the primary season: 10,000 lb/trip -- After the primary whiting season: 10,000 lb/trip						
34	**Minor shelf rockfish[1/], Shortbelly, Widow & Yelloweye rockfish**							
35	midwater trawl for Widow rockfish	Before the primary whiting season: CLOSED -- During primary whiting season: In trips of at least 10,000 lb of whiting, combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED						
36	large & small footrope gear	150 lb/ month		300 lb/ 2 months				
37	selective flatfish trawl gear	300 lb/ month			1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
38	multiple bottom trawl gear [8/]	300 lb/ month			300 lb/ 2 months, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month

Table 2-6a. 2006 Trip limits for limited entry trawl gears north of 40°10' N latitude (continued).

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]: North of 40°10' N. lat.	75 fm - modified 200 fm [7/]		75 - 200 fm		100 - 200 fm	75 fm - 200 fm	75 fm - modified 200 fm [7/]
39	**Canary rockfish**							
40	large & small footrope gear	CLOSED						
41	selective flatfish trawl gear	100 lb/ month			300 lb/ month		100 lb/ month	
42	multiple bottom trawl gear [8/]	CLOSED						
43	**Yellowtail**							
44	midwater trawl	Before the primary whiting season: CLOSED -- During primary whiting season: In trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED						
45	large & small footrope gear	150 lb/ month		300 lb/ 2 months				
46	selective flatfish trawl gear	1,000 lb/ month		2,000 lb/ 2 months				
47	multiple bottom trawl gear [8/]	150 lb/ month		300 lb/ 2 months				
48	**Minor nearshore rockfish & Black rockfish**							
49	large & small footrope gear	CLOSED						
50	selective flatfish trawl gear	300 lb/ month						
51	multiple bottom trawl gear [8/]	CLOSED						
52	**Lingcod[4/]**							
53	large & small footrope gear	600 lb/ month		1,200 lb/ 2 months				
54	selective flatfish trawl gear	600 lb/ month		1,200 lb/ 2 months				
55	multiple bottom trawl gear [8/]	600 lb/ month		1,200 lb/ 2 months				
56	**Pacific cod**	Not limited		30,000 lb/ 2 months	70,000 lb/ 2 months			30,000 lb/ 2 months
57	**Spiny dogfish**	Not limited		200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
58	**Other Fish [5/]**	Not limited						

1/ Bocaccio, chilipepper and cowcod are included in the trip limits for minor shelf rockfish.
2/ Splitnose rockfish is included in the trip limits for minor slope rockfish.
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 200 fm" line is modified to exclude certain petrale sole areas from the RCA.
8/ If a vessel has both selective flatfish gear and large or small footrope gear on board during a cumulative limit period (either simultaneously or successively), the most restrictive cumulative limit for any gear on board during the cumulative limit period applies for the entire cumulative limit period.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-6b. 2006 Trip limits for limited entry trawl gears south of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:							
	40°10' - 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	38° - 34°27' N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	South of 34°27' N. lat.	75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands				75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands
	Small footrope gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.							
	See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).							
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.							
1	**Minor slope rockfish[2/] & Darkblotched rockfish**							
2	40°10' - 38° N. lat.	4,000 lb/ month		8,000 lb/ 2 months				
3	South of 38° N. lat.	20,000 lb/ month		40,000 lb/ 2 months				
4	**Splitnose**							
5	40°10' - 38° N. lat.	4,000 lb/ month		8,000 lb/ 2 months				
6	South of 38° N. lat.	20,000 lb/ month		40,000 lb/ 2 months				
7	**DTS complex**							
8	Sablefish	8,500 lb/ month		17,000 lb/ 2 months				
9	Longspine thornyhead	9,500 lb / month		19,000 lb/ 2 months				
10	Shortspine thornyhead	2,450 lb/ month		4,900 lb/ 2 months				
11	Dover sole	25,000 lb/ month		50,000 lb/ 2 months	35,000 lb/ 2 months			
12	**Flatfish** (except Dover sole)							
13	Other flatfish[3/] & English sole							
14	40°10' - 38° N. lat.	55,000 lb/ month		Other flatfish, English sole & Petrale sole: 110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole.				110,000 lb/ 2 months
15	South of 38° N. lat.	55,000 lb/ month						110,000 lb/ 2 months
16	Petrale sole	30,000 lb/ month						60,000 lb/ 2 months

Table 2-6b. 2006 Trip limits for limited entry trawl gears south of 40°10' N latitude (continued).

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:							
	40°10' - 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	38° - 34°27' N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	South of 34°27' N. lat.	75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands				75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands
17	Arrowtooth flounder							
18	40°10' - 38° N. lat.	5,000 lb/ month		10,000 lb/ 2 months				
19	South of 38° N. lat.							
20	**Whiting**							
21	midwater trawl	Before the primary whiting season: CLOSED -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED						
22	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip -- During the primary season: 10,000 lb/trip -- After the primary whiting season: 10,000 lb/trip						
23	**Minor shelf rockfish[1/], Chilipepper, Shortbelly, Widow, & Yelloweye rockfish**							
24	large footrope or midwater trawl for Minor shelf rockfish & Shortbelly	300 lb/ month						
25	large footrope or midwater trawl for Chilipepper	1,000 lb/ months		2,000 lb/ 2 months	12,000 lb/ 2 months		8,000 lb/ 2 months	
26	large footrope or midwater trawl for Widow & Yelloweye	CLOSED						
27	small footrope trawl for Minor Shelf, Shortbelly, Widow & Yelloweye	300 lb/ month			300 lb/ month			
28	small footrope trawl for Chilipepper				500 lb/ month			
29	**Bocaccio**							
30	large footrope or midwater trawl	150 lb/ month		300 lb/ 2 months				
31	small footrope trawl	CLOSED						
32	**Canary rockfish**							
33	large footrope or midwater trawl	CLOSED						
34	small footrope trawl	100 lb/ month			300 lb/ month		100 lb/ month	
35	**Cowcod**	CLOSED						
36	**Minor nearshore rockfish & Black rockfish**							
37	large footrope or midwater trawl	CLOSED						
38	small footrope trawl	300 lb/ month						
39	**Lingcod[4/]**							
40	large footrope or midwater trawl	600 lb/ month		1,200 lb/ 2 months				
41	small footrope trawl							
42	**Pacific cod**	Not limited		30,000 lb/ 2 months	70,000 lb/ 2 months			30,000 lb/ 2 months
43	**Spiny dogfish**	Not limited		200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
44	**Other Fish[5/] & Cabezon**	Not limited						

1/ Yellowtail is included in the trip limits for minor shelf rockfish.
2/ POP is included in the trip limits for minor slope rockfish
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ Other fish are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 200 fm" line is modified to exclude certain petrale sole areas from the RCA.

of 35,000 mt, and then setting aside 1,800 mt for incidental bycatch in non-whiting fisheries and 200 mt for research catch. The resulting yield is then allocated between factory trawlers or catcher-processors (34%), vessels delivering to at-sea processors or motherships (24%), and vessels delivering to shore-based processing plants (42%). Table 2-7 indicates the set asides and allocations for 2006 fisheries.

Table 2-7. Pacific whiting set-asides and allocations by fishing sector specified in 2006.

Sector	Set-aside or allocation (mt)
Tribal whiting	35,000
Non-whiting fisheries	1,800
Research	200
Catcher-processors	78,903
Motherships	55,697
Shore-based whiting	97,469
Total	269,069

The GMT recommended exploring overfished species' bycatch implications in the Pacific whiting fishery using a 4-year weighted average bycatch model (the years 2001-2004 were used to project 2005 impacts and the years 2002-2005 were used to project 2006 impacts- see chapter 4 for more details). The rates used to project 2006 whiting fishery impacts were applied to the 2006 OY under this alternative (these same rates are used to explore bycatch implications in 2007 and 2008 Pacific whiting fisheries- see below). The Council again specified bycatch caps for stocks that could potentially constrain opportunities in the Pacific whiting and other West Coast fishing sectors in 2006. The two overfished West Coast groundfish stocks that are incidentally caught in the whiting-directed trawl fishery and for which bycatch caps have been specified in 2006 regulations are canary and widow rockfish. The Council and NMFS decided to set aside 4.7 mt of canary rockfish and 200 mt of widow rockfish for the 2006 non-tribal whiting-directed fisheries. The non-tribal sectors of the whiting fishery would close prior to reaching their whiting allocations if these caps were reached inseason. However, the Council reserved the ability to change these caps inseason if there was unused yield available and it was needed to keep whiting fisheries open.

2.2.3.1.2 Limited Entry Fixed Gear Fisheries

Limited entry fixed gear trip limits and the nontrawl RCA configuration as of May 2006 describe the No Action Alternative and are shown in Tables 2-8a (north of 40°10' N latitude) and 2-8b (south of 40°10' N latitude). Under the No Action Alternative, the nontrawl RCA is defined by management lines specified with waypoints at roughly 30 fm to 100 fm in waters off northern California (north of 40°10' N latitude) and Oregon; and zero fm to 100 fm in waters off Washington. The nontrawl RCA south of 40°10' N latitude and north of Point Conception at 34°27' N latitude under the No Action Alternative is defined by management lines specified with waypoints at roughly 30 fm to 150 fm during periods 1, 2, 5, and 6 and 20 fm to 150 fm during periods 3 and 4. There is an additional closure between zero fm and 10 fm around the Farallon Islands to reduce impacts on shallow nearshore rockfish in that area. The nontrawl RCA south of Point Conception is defined by management lines specified with waypoints at roughly 60 fm to 150 fm. This more liberal RCA can be accommodated by the minimal occurrence of canary rockfish in the Southern California Bight. Canary and yelloweye rockfish are not allowed to be landed in the limited entry fixed gear fishery under the No Action Alternative.

The primary sablefish fishery, open to limited entry fixed gear permit holders that have a sablefish endorsement, runs from April 1 through October 31. Permit stacking is allowed in this fishery, where

Table 2-8a. 2006 Trip limits for limited entry fixed gears north of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6]:						
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
	See § 660.370 and § 660.382 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish [2] & Darkblotched rockfish**	4,000 lb/ 2 months					
2	**Pacific ocean perch**	1,800 lb/ 2 months					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months					
4	**Longspine thornyhead**	10,000 lb/ 2 months					
5	**Shortspine thornyhead**	2,000 lb/ 2 months					
6	**Dover sole**	5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.		5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.			
7	**Arrowtooth flounder**						
8	**Petrale sole**						
9	**English sole**						
10	**Other flatfish[1]**						
11	**Whiting**	10,000 lb/ trip					
12	**Minor shelf rockfish[2], Shortbelly, Widow, & Yellowtail rockfish**	200 lb/ month					
13	**Canary rockfish**	CLOSED					
14	**Yelloweye rockfish**	CLOSED					
15	**Minor nearshore rockfish & Black rockfish**						
16	North of 42° N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3]					
17	42° - 40°10' N. lat.	6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3]					
18	**Lingcod[4]**	CLOSED		800 lb/ 2 months			CLOSED
19	**Pacific cod**	Not limited	1,000 lb/ 2 months				
20	**Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
21	**Other fish[5]**	Not limited					

1/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
2/ Bocaccio, chilipepper and cowcod are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.
3/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-8b. 2006 Trip limits for limited entry fixed gears south of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
	See § 660.370 and § 660.382 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[2/] & Darkblotched rockfish**	40,000 lb/ 2 months					
2	**Splitnose**	40,000 lb/ 2 months					
3	**Sablefish**						
4	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months					
5	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
6	**Longspine thornyhead**	10,000 lb / 2 months					
7	**Shortspine thornyhead**	2,000 lb/ 2 months					
8	**Dover sole**	5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.		5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.			
9	**Arrowtooth flounder**						
10	**Petrale sole**						
11	**English sole**						
12	**Other flatfish[1/]**						
13	**Whiting**	10,000 lb/ trip					
14	**Minor shelf rockfish[2/], Shortbelly, & Widow rockfish**						
15	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED	200 lb/ 2 months		300 lb/ 2 months	
16	South of 34°27' N. lat.	3,000 lb/ 2 months					
17	**Chilipepper rockfish**	2,000 lb/ 2 months, this opportunity only available seaward of the nontrawl RCA					
18	**Canary rockfish**	CLOSED					
19	**Yelloweye rockfish**	CLOSED					
20	**Cowcod**	CLOSED					
21	**Bocaccio**						
22	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED	100 lb/ 2 months	300 lb/ 2 months		
23	South of 34°27' N. lat.	300 lb/ 2 months		300 lb/ 2 months			
24	**Minor nearshore rockfish & Black rockfish**						
25	Shallow nearshore	300 lb/ 2 months	CLOSED	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
26	Deeper nearshore						
27	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED	500 lb/ 2 months		400 lb/ 2 months	500 lb/ 2 months
28	South of 34°27' N. lat.			600 lb/ 2 months			400 lb/ 2 months
29	California scorpionfish	300 lb/ 2 months	CLOSED	300 lb/ 2 months	400 lb/ 2 months		300 lb/ 2 months

Table 2-8b. 2006 Trip limits for limited entry fixed gears south of 40°10' N latitude (continued).

	JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
Rockfish Conservation Area (RCA)[5/]:						
40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
30 **Lingcod[3/]**	CLOSED		800 lb/ 2 months			CLOSED
31 **Pacific cod**	Not limited	1,000 lb/ 2 months				
32 **Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
33 **Other fish[4/] & Cabezon**	Not limited					

1/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
2/ POP is included in the trip limits for minor slope rockfish. Yellowtail is included in the trip limits for minor shelf rockfish.
3/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
4/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
5/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

more than one and up to three permits may be used on a single vessel during the primary sablefish season. Limited entry permits with sablefish endorsements are assigned to one of three different cumulative trip limit tiers, based on the qualifying catch history of the permit. The 2006 sablefish limits are as follows: tier 1 = 62,700 lb, tier 2 = 28,500 lb, and tier 3 = 16,300 lb.

The Council and NMFS adopted a similar change in cumulative trip limits for Pacific cod and spiny dogfish for limited entry fixed gear fisheries as they did for limited entry trawl fisheries beginning in March 2006 (period 2). While the spiny dogfish limits for limited entry fixed gear fisheries were the same for spiny dogfish as in the limited entry trawl fishery, the Pacific cod limits were much lower since Pacific cod are less frequently caught by fixed gears. Tables 2.7a and 2.7b depict the 2006 Pacific cod and spiny dogfish trip limits for limited entry fixed gear fisheries.

Limited entry fixed gears are not allowed to be fished in the Cowcod Conservation Areas (Figure 2-3) under the No Action Alternative, except for some nearshore commercial fishing opportunities described in section 2.2.3.1.4.

2.2.3.1.3 Open Access Fisheries

Open access fisheries are those West Coast commercial fisheries comprised of vessels without a federal limited entry trawl or limited entry fixed gear permit that catch groundfish either as target species (directed groundfish fisheries) or incidentally while targeting non-groundfish species (incidental groundfish fisheries).

Open access gears that fish the bottom and any of the gears used in the directed groundfish fisheries are not allowed to be fished in the Cowcod Conservation Areas (Figure 2-3) under the No Action Alternative, except for some nearshore commercial fishing opportunities described in section 2.2.3.1.4.

Directed Groundfish Fisheries

There are directed groundfish fisheries that target nearshore species (see the following section 2.2.3.1.4) and those operating on the shelf and slope primarily targeting sablefish (daily-trip-limit fishery) and slope rockfish species. This section describes the No Action management measures associated with the latter category of open access vessels targeting groundfish offshore in federal waters.

Open access trip limits and estimated impacts of 2006 management measures as of May 2006 describe the No Action Alternative and are shown in Tables 2-9a (north of 40°10' N latitude) and 2-9b (south of 40°10' N latitude). The same nontrawl RCA described for limited entry fixed gears under the No Action

Table 2-9a. 2006 trip limits for open access gears north of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
	See § 660.370 and § 660.383 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[1/] & Darkblotched rockfish**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 3,000 lb/ 2 months				
4	**Thornyheads**	CLOSED					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weights per line are not subject to the RCAs.	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.				
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**English sole**						
9	**Other flatfish[2/]**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish[1/], Shortbelly, Widow, & Yellowtail rockfish**	200 lb/ month					
12	**Canary rockfish**	CLOSED					
13	**Yelloweye rockfish**	CLOSED					
14	**Minor nearshore rockfish & Black rockfish**						
15	North of 42° N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
16	42° - 40°10' N. lat.	6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
17	**Lingcod[4/]**	CLOSED		300 lb/ month			CLOSED
18	**Pacific cod**	Not limited	1,000 lb/ 2 months				
19	**Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
20	**Other Fish[5/]**	Not limited					

Table 2-9a. 2006 trip limits for open access gears north of 40°10' N latitude (continued).

21	**PINK SHRIMP NON-GROUNDFISH TRAWL** *(not subject to RCAs)*	
22	North	**Effective April 1 - October 31:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.
23	**SALMON TROLL**	
24	North	Salmon trollers may retain and land up to 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.

1/ Bocaccio, chilipepper and cowcod rockfishes are included in the trip limits for minor shelf rockfish.
Splitnose rockfish is included in the trip limits for minor slope rockfish.
2/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
3/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.
4/ The size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-9b. 2006 trip limits for open access gears south of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
	See § 660.370 and § 660.383 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[1/] & Darkblotched rockfish**						
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3	South of 38° N. lat.	10,000 lb/ 2 months					
4	**Splitnose**	200 lb/ month					
5	**Sablefish**						
6	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months		300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 3,000 lb/ 2 months			
7	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
8	**Thornyheads**						
9	40°10' - 34°27' N. lat.	CLOSED					
10	South of 34°27' N. lat.	50 lb/ day, no more than 1,000 lb/ 2 months					
11	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.		3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.			
12	**Arrowtooth flounder**						
13	**Petrale sole**						
14	**English sole**						
15	**Other flatfish[2/]**						
16	**Whiting**	300 lb/ month					
17	**Minor shelf rockfish[1/], Shortbelly, Widow & Chilipepper rockfish**						
18	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED	200 lb/ 2 months		300 lb/ 2 months	
19	South of 34°27' N. lat.	750 lb/ 2 months					
20	**Canary rockfish**	CLOSED					
21	**Yelloweye rockfish**	CLOSED					
22	**Cowcod**	CLOSED					
23	**Bocaccio**						
24	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED	100 lb/ 2 months		200 lb/ 2 months	
25	South of 34°27' N. lat.	100 lb/ 2 months		100 lb/ 2 months			

Table 2-9b. 2006 trip limits for open access gears south of 40°10' N latitude (continued).

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
26	**Minor nearshore rockfish & Black rockfish**						
27	Shallow nearshore	300 lb/ 2 months	CLOSED	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
28	Deeper nearshore						
29	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED	500 lb/ 2 months		400 lb/ 2 months	500 lb/ 2 months
30	South of 34°27' N. lat.			600 lb/ 2 months			400 lb/ 2 months
31	California scorpionfish	300 lb/ 2 months	CLOSED	300 lb/ 2 months	400 lb/ 2 months		300 lb/ 2 months
32	**Lingcod[3/]**	CLOSED		300 lb/ month, when nearshore open			CLOSED
33	**Pacific cod**	Not limited	1,000 lb/ 2 months				
34	**Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
35	**Other Fish[4/] & Cabezon**	Not limited					

Alternative above would also apply for those open access fisheries not exempt from the RCA restrictions.

In 2005, a factory longliner from Alaska announced plans to target spiny dogfish in West Coast waters under the open access limits, which were unlimited for species such as spiny dogfish in the Other Fish complex. Fixed gear fisheries targeting spiny dogfish are known to incidentally catch canary and yelloweye rockfish. This unanticipated entrant to the open access fishery was of particular concern since the volume of dogfish that could be landed could incur a significant bycatch of canary and yelloweye rockfish, especially for vessel operators unfamiliar with the West Coast distribution of these species and the techniques employed to avoid them. Therefore, on May 2, 2005, NMFS implemented an emergency rule to specify canary and yelloweye rockfish bycatch caps for the directed open access fishery of 1.0 mt and 0.6 mt, respectively. All directed open access fisheries (those fisheries targeting groundfish species) would close if any of these caps were projected to be attained early in the fishing season. The Council and NMFS increased these caps to 3.0 mt for each of the species later in the year (implemented on July 1) based on increased availability of canary and yelloweye rockfish. While the factory longliner never did implement plans to target spiny dogfish on the West Coast, the Council and NMFS did by decide to change the spiny dogfish limits for limited entry and open access fisheries from unlimited to specified bimonthly trip limits for the open access fishery beginning in March 2006 (Tables 2-9a and 2-9b). While this action did not wholly address the particular vulnerability of lack of effort controls in the open access fishery, it did address bycatch concerns for targeting spiny dogfish in open access (and limited entry) fisheries.

The same 2006 change in Pacific cod management measures adopted for the limited entry fixed gear fishery was made for open access fisheries by adopting new bimonthly trip limits for this stock in March 2006 (Tables 2-9a and 2-9b).

The sablefish daily trip limit (DTL) fishery north of 36° N latitude has caught less than their allocation in recent years. In 2005, the DTL limits for January-September were 300 pounds per day, or one landing per week up to 900 pounds, not to exceed 3,600 pounds per two months. These DTL limits were increased for October through December to 500 pounds per day, or one landing per week up to

1,500 pounds, not to exceed 9,000 pounds per two months. The Council recommended maintaining the previously scheduled daily limit of 300 pounds per day, raising the weekly limit to 1,000 pounds, and raising the two month limit to 5,000 pounds for December 2005. The Council considered a more liberal increase in daily and weekly DTL limits, but was concerned with the inability to control effort in this fishery and therefore recommended a cautious approach to liberalizing this fishery. In April 2006, the Council addressed an increased interest in the DTL sablefish fishery and was especially concerned given the reduced salmon fishing opportunities available. The concern was the open access sablefish quota may be attained early in 2006 without an effective open access effort control mechanism. Therefore, the Council adopted a decreased DTL bimonthly limit for sablefish of 3,000 pounds and tasked the GMT to review effort shifts into this fishery and consider increased DTL limits in June.

Incidental Groundfish Fisheries

West Coast commercial fishing vessels targeting non-groundfish species, but landing groundfish under open access limits are included in the category of incidental open access fisheries. In some cases, such as the ridgeback prawn trawl fishery south of 34°27' N latitude, the northern pink shrimp fishery, and the salmon troll fishery, there are specific exemptions from non-trawl RCA restrictions while landing some groundfish species.

Under the No Action Alternative, the ridgeback prawn trawl fishery south of 34°27' N latitude is allowed to operate out to the 100 fm line regardless of the non-trawl RCA configuration south of Pt. Conception. This exemption is allowed because ridgeback prawn trawling occurs over soft mud substrates where depleted rockfish species do not occur and ridgeback prawns are found largely adjacent to the 100 fm isobath in this area. The pink shrimp trawl fishery is not restricted by an RCA, but approved bycatch reduction devices or fish excluders in shrimp trawls are mandated to minimize incidental groundfish bycatch. The salmon troll fishery is exempted from RCA restrictions, but groundfish species, including lingcod, are not allowed to be retained while fishing in the non-trawl RCA. The only exemption to this regulation under the No Action Alternative is an incidental landing allowance of up to 1 lb of yellowtail rockfish per 2 lbs of salmon landed with a cumulative monthly landing limit of 200 lbs of yellowtail rockfish, both within and outside the RCA. Otherwise, non-trawl RCA restrictions apply to incidental groundfish fisheries if groundfish are to be legally retained and landed under the open access limits.

2.2.3.1.4 Nearshore Commercial Fisheries

The majority of vessels participating in nearshore commercial fisheries do not hold federal limited entry permits, and the most common gear used is jig gear. However, some vessels use longline gear to target nearshore species and, in rare instances, pots or traps are used in the nearshore fishery. California and Oregon limit entry to the nearshore groundfish fishery by requiring a state limited entry permit to take commercial quantities of nearshore groundfish species (see sections 2.1.4.1 and 2.1.4.2 for the lists of nearshore rockfish species targeted in nearshore commercial fisheries north and south of 40°10' N latitude). Washington does not allow a nearshore commercial fishery. More conservative state harvest targets or guidelines than those specified in federal regulations exist for most nearshore species and state trip limits supersede federal limits in these cases. State trip limits are designed to stay within nearshore species harvest caps (Tables 2-10 and 2-11) while providing a year-round opportunity, if possible. Federal management measures for West Coast nearshore commercial groundfish fisheries are typically stratified north and south of 40°10' N latitude.

Table 2-10. Nearshore groundfish species' harvest limits, including harvest targets, OYs, and harvest guidelines by West Coast region, 2002-2006.

	2002			2003		
Species Group	Recreational	Commercial	Total	Recreational	Commercial	Total
	North of Cape Mendocino					
Minor Nearshore Rockfish North[1,4]	663	**324**	**987**	740	**188**	**928**
	Oregon/California Border to Cape Mendocino					
Black and Blue Rockfish	-----	-----	-----	36.8	58.5	95.3
Other Nearshore Rockfish	-----	-----	-----	3.7	10.1	13.8
Total Minor NS RF	-----	-----	-----	40.5	68.6	109
	Cape Mendocino to California/Mexico Border					
Shallow Nearshore Rockfish South	-----	-----	-----	66	38.8	105
Deeper Nearshore Rockfish South[3]	-----	-----	-----	303.1	48	351
California Scorpionfish	-----	-----	-----	63.9	21	84.9
Total Minor Nearshore RF South	532	**130**	**662**	433	**108**	**541**

	2004			2005			2006		
Species Group	Recreational	Commercial	Total	Recreational	Commercial	Total	Recreational	Commercial	Total
	North of Cape Mendocino								
Minor Nearshore Rockfish North	68	**54**	**122**	68	**54**	**122**	68	**54**	**122**
	Statewide								
Black Rockfish[5]	186	140	**326**	175	141	**316**	170	139	**309**
	Oregon/California Border to Cape Mendocino								
Black Rockfish[5]	72	123	194	74	116	190	72	113	185
Other Nearshore Rockfish North	6.6	14.8	21.4	6.6	14.8	21.4	6.6	14.8	21.4
	Cape Mendocino to California/Mexico Border								
Minor Nearshore Rockfish South[2]	375	**97**	**494**	383	**97**	**494**	383	**97**	**494**
Shallow Nearshore Rockfish South	66	38.8	105	-----	-----	-----	-----	-----	-----
Deeper Nearshore Rockfish South[3]	245.1	37.2	282	-----	-----	-----	-----	-----	-----
California Scorpionfish	63.9	21	84.9	-----	-----	-----	-----	-----	-----
Black Rockfish[5]	114	17	131	101	25	126	99	25	124

1/ Non-bolded numbers are harvest targets; bolded numbers are either OYs or harvest guidelines

2/ Minor Nearshore Rockfish includes a reserve of 22 mt in 2004, 14 mt in 2005, and 14 mt in 2006; 2004 OY corrected from 615 mt (in 2004 Fed. Reg.) to 494 mt so does not include the 121 mt that was removed from this group in 2003 when the OY was calculated as 50% of recent landings; the confusion exists because the 121 mt was kept as a reserve in the overall Minor Rockfish OY and was accidentally added back into the NS RF OY in 2004.

3/ Starting in 2004, Deeper Nearshore does not include black rockfish.

4/ Black Rockfish north of 40º 30' to 43º 00' had an ABC of 500 mt in 2003.

5/ The black rockfish OY south of 46º16' N Lat. is subdivided with separate HGs being set for the area north (58 percent of OY) and south (42 percent of OY) of 42º N Lat. For the area south of 42º N Lat., 60 percent of the HG is to be applied to the area north of 40º10' N Lat. and 40 percent applied to the area south of 40º10' N Lat.

Nearshore Commercial Fisheries North of 40°10' N latitude

There are nearshore commercial fisheries north of 40°10' N latitude to the Oregon-Washington border at 46°10' N latitude; Washington does not allow nearshore commercial fisheries in their state waters. A depiction of the season duration for northern nearshore commercial fisheries and predicted black, canary, and yelloweye rockfish impacts under the No Action and action alternatives is provided in Table 2-12a.

Table 2-11. State and federal harvest guidelines specified for state-managed groundfish fisheries in California in 2006.

Species or Species complex	Sector	Harvest guideline in mt (or pounds)
Canary Rockfish	Rec.	9.3
Yelloweye Rockfish	Rec.	3.7
Black Rockfish	NS Comm.	139
	Rec.	170
	Total	309
Minor Nearshore Rockfish	NS Comm.	97
	Rec.	383
	Total	480
Cabezon	NS Comm.	42.1 (92,800)
	Rec.	26.9 (59,300)
	Total	69 (152,100)
Greenlings	NS Comm.	1.5 (3,400)
	Rec.	15.5 (34,200)
	Total	17.1 (37,600)
Lingcod	Rec.	422

Table 2-12a. Season structure and expected yelloweye rockfish and canary rockfish impacts under the 2007-2008 No Action and action alternatives for nearshore commercial fisheries north of 40°10' N latitude.

Alternative	Season Duration	Black Rockfish Reduction (%)	Shoreward RCA (fm)	Estimated Impact (mt) to Yelloweye Rockfish	Estimated Impact (mt) to Canary Rockfish
No Action	12 month season	0	30	2.1	1.7
1	<6 month season	60	20	0.8	0.7
2	12 month season	10	20	1.3	1.2
3a	12 month season	0	20	1.4	1.3
3b	12 month season	0	30	2.1	1.7

Under the No Action Alternative, the nontrawl RCA is defined by management lines specified with waypoints at roughly 30 fm to 100 fm in waters off northern California (north of 40°10' N latitude) and Oregon; and zero fm to 100 fm in waters off Washington. In Oregon, those limited entry permit holders may land commercial quantities of black and blue rockfish under state trip limits, with an additional 15 lbs per day of other nearshore groundfish species. Vessels that also have a nearshore endorsement, in addition to the black/blue limited entry permit may land commercial quantities of other nearshore rockfish (which includes two rockfish with a federal designation as shelf rockfish - tiger and vermilion rockfish), cabezon, and greenling under state trip limits. For vessels that do not hold a state permit or endorsement, an incidental landing limit of no more than 15 pounds per day of any combination of black rockfish, blue rockfish, and/or other nearshore fish is allowed, with a few exceptions. Salmon trollers with a valid troll permit may land 100 pounds of black rockfish, blue rockfish, or a combination thereof in the same landing in which a salmon is landed. These rockfish may only be landed dead. If the cumulative landing of black and blue rockfish combined in the salmon troll fishery reaches 3,000 pounds in any calendar year, then each salmon troll vessel is limited to 15 pounds of black rockfish, blue rockfish, or a combination thereof per troll landing for the remaining calendar year. Trawlers may land up to 1,000 pounds of black rockfish, blue rockfish, or a combination thereof per calendar year and these fish must be 25 percent or less of the total poundage of each landing and must be landed dead.

The 2006 federal trip limit for nearshore species north of 40°10' N latitude to 42° N latitude is 6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish. The 2006 federal trip limit for nearshore species north of 42° N latitude is 5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish. This listed limit has been superseded by the more conservative Oregon state limits for the last several years.

Nearshore Commercial Fisheries South of 40°10' N latitude

In California, those limited entry permit holders who also have either a shallow nearshore fishery or deeper nearshore fishery permit administered by CDFG may land minor nearshore rockfish from either the shallow nearshore or deeper nearshore complexes. Trip limits for shallow nearshore rockfish, deeper nearshore rockfish, and California scorpionfish vary by period (Table 2-8b).

A depiction of the season duration for southern nearshore commercial fisheries and predicted nearshore rockfish, canary, and yelloweye rockfish impacts under the No Action and action alternatives is provided in Table 2-12b for the area 40°10' N. latitude to 34°27' N. latitude.

Table 2-12b. Season structure and expected yelloweye rockfish and canary rockfish impacts under the 2007-2008 No Action and action alternatives for nearshore commercial fisheries south of 40°10' N latitude to 34°27' N. latitude .

Alternative	Season Duration	Nearshore Rockfish Reduction (%)	Shoreward RCA (fm)	Estimated Impact (mt) to Yelloweye Rockfish	Estimated Impact (mt) to Canary Rockfish
No Action	10 month season	0	30 (Jan-Apr, Sep-Dec) 20 (May-Aug)	0.0	0.33
1	8 month season	15	20	0.0	0.26
2	10 month season	5	20	0.0	0.30
3a	10 month season	5	30	0.0	0.31
3b	10 month season	0	30	0.0	0.56

Under the No Action Alternative, the nontrawl RCA south of 40°10' N latitude and north of Point Conception at 34°27' N latitude is defined by management lines specified with waypoints at roughly 30 fm to 150 fm during periods 1, 2, 5, and 6 and at 20 fm to 150 fm during periods 3 and 4. There is an additional closure between zero fm and 10 fm around the Farallon Islands to reduce impacts on shallow nearshore rockfish in that area. The nontrawl RCA south of Point Conception is defined by management lines specified with waypoints at roughly 60 fm to 150 fm. This more liberal RCA can be accommodated by the minimal occurrence of canary rockfish in the Southern California Bight. Status quo management is proposed south of Point Conception under action alternatives 2 and 3 due to the low incidence rate of overfished species; a nontrawl RCA line of 40 fm is proposed under action alternative 1 due to impacts to bocaccio rockfish. Canary and yelloweye rockfish are not allowed to be landed in the fixed gear fisheries, including those targeting nearshore groundfish species, under the No Action Alternative.

Trip limits for shallow nearshore rockfish, deeper nearshore rockfish, and California scorpionfish vary by period (Table 2-8b). However, period 2 is closed for these species north and south of Point Conception, and shelf rockfish is closed at this time to minimize discard of nearshore species during the closed period. There is also a small and variable trip limit for bocaccio during the open nearshore periods to allow some incidental bycatch to be landed rather than discarded dead at sea. Species' harvest guidelines for California nearshore commercial fisheries are depicted in Table 2-11.

There is some nearshore commercial fishing allowed in the Cowcod Conservation Areas (Figure 2-3) in depths shallower than 20 fm under the No Action Alternative. Only southern minor nearshore rockfish, (both shallow and deeper nearshore rockfish- see section 2.1.4.1 for the list of species in this complex), California scorpionfish, cabezon, greenlings, California sheephead, and ocean whitefish are allowed to be retained in depths <20 fm in the CCAs.

2.2.3.1.5 Tribal Fisheries

The Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) prosecuted their groundfish fisheries in 2005-2006 with the following allocations and trip limits. The 2006 sablefish allocation was 10% of the total catch OY (for the portion of the stock north of 36° N latitude) of 7,363 mt. This provided an allocation of 736.3 mt of sablefish, which is further reduced after deducting an assumed 2.3% discard mortality for a landed catch allocation of 719.4 mt. The tribal commercial harvest of black rockfish was managed with a harvest guideline of 20,000 lbs north of Cape Alava, Washington at 48°09'30" N latitude, and 10,000 lbs between Destruction Island, Washington at 47°40' N latitude and Leadbetter Point, Washington at 46°38'10" N latitude. There were no harvest restrictions on black rockfish between Cape Alava and Destruction Island. Thornyheads were subject to a 300 lb trip limit as were canary rockfish. Yelloweye rockfish were subject to a 100 lb trip limit. For yellowtail rockfish the entire Makah tribal fleet (the only tribal fleet that participated in a midwater fishery) was subject to a cumulative landing limit of 180,000 lbs/two months. Widow rockfish landings were limited to 10% of the weight of yellowtail rockfish landed in any two-month period. These midwater landing limits were subject to inseason adjustments to minimize the take of canary and widow rockfish. Other rockfish, including species in the minor nearshore, minor shelf, and minor slope rockfish complexes were subject to either a 300 lb trip limit per species or complex, or to the non-tribal limited entry trip limit for those species if those limits were less restrictive. Rockfish taken during the open competition tribal commercial fisheries for Pacific halibut were not subject to trip limits. A full rockfish retention program, as well as a tribal observer program, was in place to provide catch accountability. Lingcod were subject to a 600 pound per day and 1,800 pound per week limit for all tribal fisheries except for the treaty troll fishery which was limited to 1,000 pounds per day and 4,000 pounds per week. A petrale sole trip limit of 50,000 lbs/two months for the Makah bottom trawl fleet was specified for the entire year. Trip limits for Pacific cod, English sole, rex sole, arrowtooth flounder, and other flatfish in the tribal bottom trawl fishery were the same as for non-tribal limited entry trawl fishery at the start of the season (Table 2-6a) using the same Council-approved gear. The tribal plan was not to reduce these limits inseason because of the low expected catch unless catch statistics indicated that the tribes would attain more than half the harvest of these species in their usual and accustomed (U and A) fishing areas. The tribal allocation of Pacific whiting in 2006 was 35,000 mt based on the sliding scale allocation formula that specifies the tribal whiting OY based on the total U.S. whiting OY (Table 2-7). The Makah tribe was the only one of the four tribes prosecuting a whiting-directed fishery in 2006, or proposing a whiting-directed fishery for 2007-2008.

2.2.3.1.6 Washington Recreational Fisheries

In 2005 and 2006, the Washington recreational fishery was open year round for groundfish except lingcod, which was open from the Saturday closest to March 15 through the Saturday closest to October 15 in Marine Areas 1-3 (from the Oregon/Washington border at 46º16' N latitude north to Cape Alava at 48º10' N latitude), and from April 15 through the Saturday closest to October 15 or October 15, whichever date is earlier, in Marine Area 4 (Cape Alava to the U.S./Canada border). In 2005, Marine

Areas 1-3 were open from March 12 through October 15, and Marine Area 4 was open from April 15 through October 15. In 2006, Marine Areas 1-3 are open from March 17 through October 14, and Marine Area 4 is open from April 15 through October 14.

Under the No Action Alternative, in 2007 and 2008, the following lingcod seasons would apply:

- Marine Areas 1-3: Open the Saturday closest to March 15 (which is March 17 in 2007 and March 15 in 2008) through the Saturday closest to October 15 (which is October 13 in 2007 and October 18 in 2008).

- Marine Area 4: Open April 15 through October 13 in 2007 and open April 15 through October 15 in 2008.

Washington has a recreational groundfish bag limit of 15 fish per day including rockfish and lingcod. Of the 15 recreational groundfish allowed to be landed per day, only 10 could be rockfish, with no retention of canary or yelloweye rockfish, and a sublimit of two lingcod with a 24-inch minimum size during the open lingcod season.

Recreational groundfish and recreational halibut fishing is prohibited within the "C-shaped" Yelloweye Rockfish Conservation Area (YRCA) (Figure 2-4). Coordinates defining the YRCA are provided in federal regulations at 50 CFR 660.390.

Washington and Oregon prosecuted their 2005 and 2006 recreational fisheries with shared harvest guidelines for canary rockfish, lingcod, and yelloweye rockfish. If the recreational harvest guideline for canary rockfish, lingcod, or yelloweye specified for the Washington/Oregon area was projected to be exceeded inseason, the Washington Department of Fish and Wildlife (WDFW) would consult with the Oregon Department of Fish and Wildlife (ODFW) and take action inseason to close all or portions of the recreational fishery deeper than 30 fm or adjust seasons, bag limits, or size limits, as needed. In 2005, the shared Washington and Oregon harvest guidelines for recreational fisheries were 8.5 mt, 234 mt, and 6.7 mt for canary rockfish, lingcod, and yelloweye rockfish, respectively. In 2006, the shared recreational harvest guidelines for canary and yelloweye remain the same, and lingcod is increased to 271 mt.

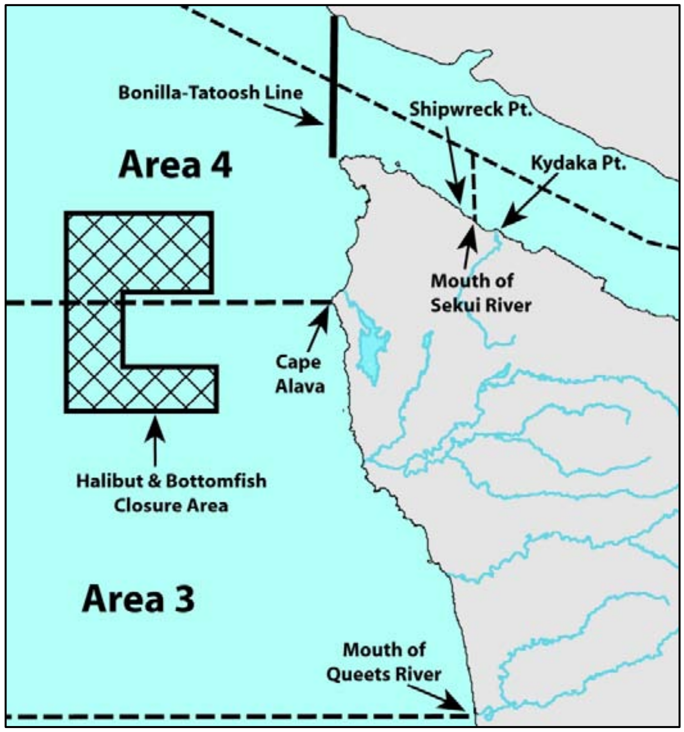


Figure 2-4. The current "C-shaped" Yelloweye Rockfish Conservation Area in waters off northern Washington where recreational groundfish and Pacific halibut fishing is prohibited.

The Washington portion of the shared canary rockfish harvest guideline was 1.7 mt and its portion of the shared yelloweye harvest guideline was 3.5 mt. These total catch amounts or harvest targets, if projected to be attained inseason by the Washington recreational fishery, were the triggers to consult with ODFW and consider an inseason action to slow or eliminate further canary or yelloweye rockfish mortality in this fishery. In 2005, WDFW projected that the yelloweye harvest target would be attained prematurely prompting such a consultation. That consultation indicated the shared yelloweye harvest guideline would be attained early, resulting in a WDFW action implemented on August 5 to close the recreational groundfish fishery outside of 30 fm in waters off Washington north of Leadbetter Pt. at 46º38'10" N latitude. The Council and NMFS adopted conforming federal regulations that were implemented on October 1, 2005.

New Washington recreational management measures were adopted for 2006 to avoid early canary and yelloweye rockfish harvest guideline attainment problems. To reduce the catch of yelloweye rockfish to stay within the Washington recreational harvest target, WDFW proposed, and the Council and NMFS adopted, the following modifications to the 2006 Washington recreational fishery:

- Prohibition of retention of rockfish and lingcod seaward of a line approximating the 20 fm depth contour from May 22, 2006, through September 30, 2006, in Marine Areas 3 and 4 (waters off Washington north of the Queets River at 47º31'42" N latitude where canary and yelloweye catches are highest) on days that halibut fishing is closed.

- Prohibition of retention of rockfish and lingcod seaward of a line approximating the 30 fm depth contour from March 18, 2006, through June 15, 2006, in Marine Area 2 (waters off Washington between Leadbetter Pt. and the Queets River).

Because the 20 fm line had not been previously analyzed, the following modification was made: where the line approximating the 20 fm depth contour extends beyond state waters and into the EEZ, the line will follow the seaward boundary of the state coastal waters.

Halibut fishery regulations for the 2006 Washington fishery became effective March 5, 2006. Therefore, it was necessary to modify the recreational groundfish regulations to conform to the new halibut regulations:

- South of Leadbetter Point to the Washington/Oregon border, when Pacific halibut are onboard the vessel, groundfish may not be taken and retained, possessed or landed, except sablefish and Pacific cod.

2.2.3.1.7 Oregon Recreational Fisheries

In 2005 (and 2006), the Oregon recreational groundfish fishery was (or is expected to be in 2006) open year round with no depth restrictions except during June through September when the fishery was open only inside 40 fm. Catches at the onset of 2005 were also managed using an 8 marine fish daily bag limit[3] including rockfish, greenling (*Hexagrammos* spp.), cabezon, and other groundfish species, but excluding salmon, lingcod, Pacific halibut, perch species, sturgeon, sanddabs, striped bass, tuna, and baitfish. There was no retention of canary and yelloweye rockfish. There was an additional daily bag limit of 25 Pacific sanddabs. Anglers could keep two lingcod with a 24 inch minimum size. Additionally, there was a minimum size limit of 16 inches for cabezon and a 10 inch minimum size limit for greenling species.

The Oregon recreational fishery was managed in 2005 and 2006 with harvest guidelines for black rockfish and widow rockfish, state harvest caps for other nearshore rockfish (including vermilion and tiger rockfish), greenlings, combined black and blue rockfish, and cabezon; and the shared Washington and Oregon harvest guidelines for canary rockfish, lingcod, and yelloweye rockfish discussed above in section 2.2.3.1.5 (Table 2-10). The state harvest caps were set using 2000 harvest as a proxy, and have only ocean boat landings applied against the harvest cap. The black rockfish harvest guideline was shared with Oregon nearshore commercial fisheries; the state allocated the guideline to these sectors as part of their authority. The Oregon black rockfish harvest guidelines for the recreational fishery was 332 mt in 2005 and 324.5 mt in 2006. The state harvest cap for cabezon was 15.8 mt in both 2005 and 2006. ODFW used their Oregon Recreational Boat Survey (ORBS) Program to monitor groundfish catches inseason. If the shared Washington and Oregon recreational harvest guideline for canary, yelloweye, or lingcod was projected to be exceeded, ODFW would consult with WDFW, and consider inseason action to close all or portions of the recreational fishery deeper than 20 fm or 30 fm or adjust seasons, bag limits, or size limits, as needed. Similar actions were considered to manage the black rockfish harvest guideline.

The Oregon Fish and Wildlife Commission (OFWC) also adopted 2005 regulations to prohibit retention of all marine fish (except sablefish, herring, anchovy, smelt, sardine, striped bass, hybrid bass, and offshore pelagic species) when Pacific halibut is retained by the vessel during open days for the all-depth sport fishery for Pacific halibut in the area between lines extending west of Oregon-Washington border and Humbug Mountain, Oregon at 42º40’30” N latitude to the EEZ boundary. This management

3 The Council originally adopted a 10 marine fish daily bag limit for Oregon recreational fisheries. However, subsequent to the Council’s final decision on 2005 and 2006 management measures in June 2004, but prior to January 1, 2005, the Oregon Fish and Wildlife Commission adopted an 8 marine fish daily bag limit. The Council and NMFS adopted conforming federal regulations that were implemented on April 1, 2005.

measure adjustment was expected to provide additional harvest reduction of overfished species and other species with harvest guidelines such as black rockfish by discouraging secondary targeting of such species. This provision also applied during all-depth halibut days in June through September when groundfish retention was prohibited seaward of the RCA boundary approximating the 40 fm depth contour.

In July 2005, ODFW took action to reduce the marine fish daily bag limit from 8 marine fish to 5 marine fish for the remainder of the year to slow the harvest of black rockfish. ODFW took additional action in August 2005 to prohibit retention of cabezon in the recreational ocean boat fishery, due to attainment of the annual state harvest cap for cabezon, and again in October 2005 to close the ocean boat groundfish fishery in waters shoreward of the 40 fathom RCA line, and prohibit retention of black rockfish, as the black rockfish harvest guideline was projected to be attained.

In December 2005, the OFWC refined management measures for the 2006 Oregon recreational groundfish fishery, based on the angler effort patterns observed in 2005. Because there was a significant increase in angler effort targeting groundfish in 2005, due primarily to the poor salmon season in the waters off Oregon, the OFWC adopted a marine fish bag limit of 6 fish in aggregate. The reduced bag limit was necessary to keep the fishery within the 2006 Oregon harvest guideline for black rockfish and to provide a 12 month fishing season. All other management measures (i.e., length restrictions for lingcod, cabezon, and kelp greenling, >40 fm closure during June-September) remain as they were specified for 2005. If the federal and state harvest guidelines are approached in 2006, ODFW would take inseason actions similar in nature to those taken in 2005. Federal conforming regulations were implemented on April 1, 2006.

In 2005 and 2006, ODFW closed the high relief areas of Stonewall Banks to the Pacific halibut fishery during the all-depth Pacific halibut season. Targeting and retention of Pacific halibut was prohibited in the area, and vessels that have retained Pacific halibut while fishing another area, were then prohibited from targeting any species within the closed area. The coordinates for the Stonewall Banks closure implemented in the Pacific halibut fishery are as follows:

1	44º37.46 N latitude	124º24.92 W longitude
2	44º37.46 N latitude	124º23.63 W longitude
3	44º28.71 N latitude	124º21.80 W longitude
4	44º28.71 N latitude	124º24.10 W longitude
5	44º31.42 N latitude	124º25.47 W longitude

Returning to the first point (Figure 2-5).

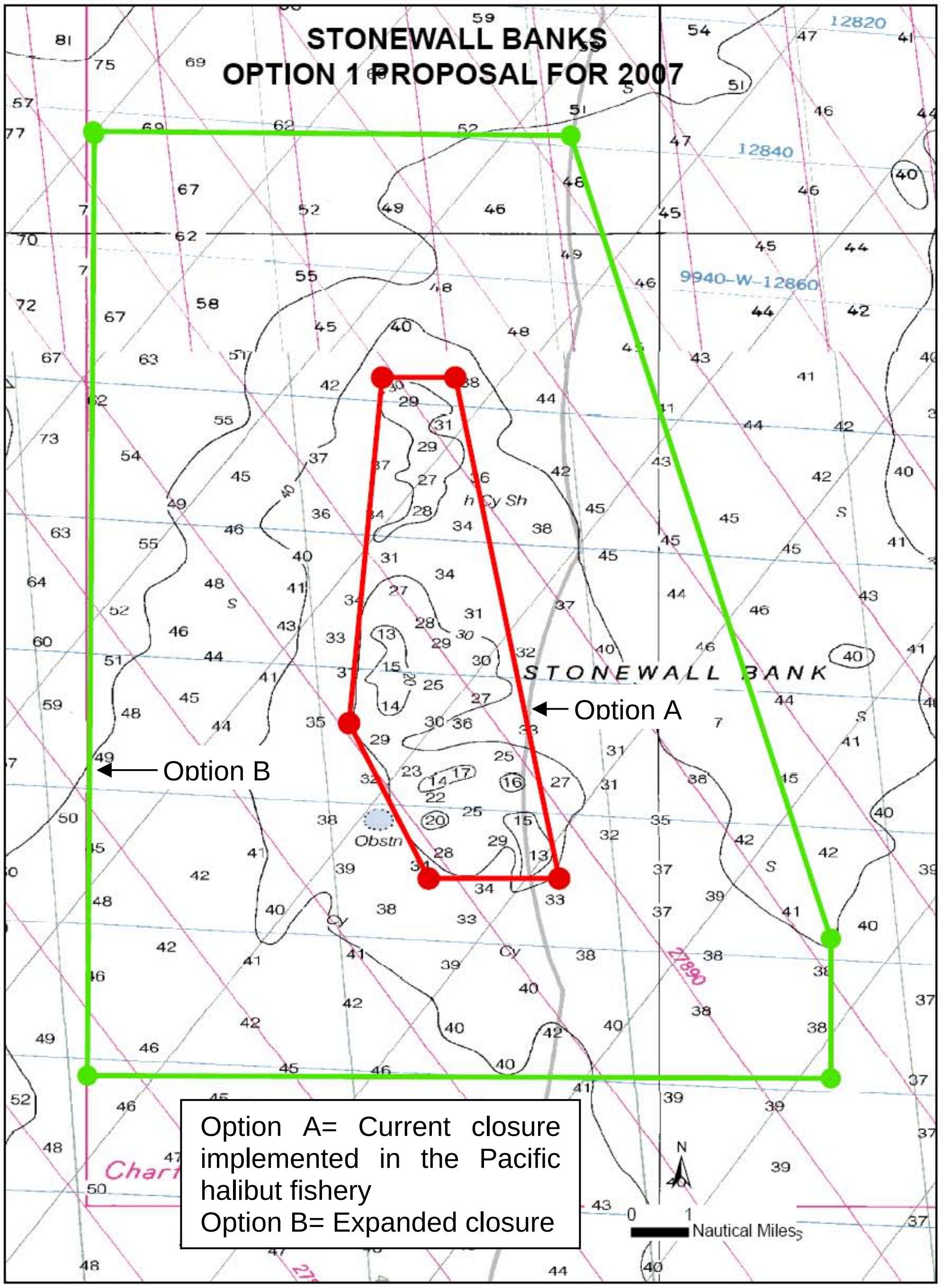


Figure 2-5. The current area closure on Stonewall Banks off the Oregon coast where Pacific halibut retention is prohibited during the all-depth fishery under the No Action Alternative (denoted Option A in figure) and the expanded closed area under Action Alternatives 1 and 3 (denoted Option B in figure).

Halibut regulations for the 2006 fishery became effective March 5, 2006. Therefore it was necessary to modify the recreational groundfish regulations to conform to the new halibut regulations:

- South of the Washington/Oregon border to Cape Falcon, OR, when Pacific halibut are onboard the vessel, groundfish may not be taken and retained, possessed or landed, except sablefish and Pacific cod.
- South of the Cape Falcon, OR, to Humbug Mountain, OR, when Pacific halibut are onboard the vessel, groundfish may not be taken and retained, possessed or landed, except sablefish, during days open to the Oregon Central Coast "all-depth" sport halibut fishery.

2.2.3.1.8 California Recreational Fisheries

For management of California's nearshore recreational groundfish fishery in 2005 and 2006, the California Fish and Game Department (CDFG) divided the coastline into five regional areas, although some regions had the same management measures and were therefore managed as a larger combined region. The five management areas, termed Rockfish/Lingcod Management Areas (RLMAs), are as follows: 1) Southern RLMA (U.S./Mexico Border to Point Conception at 34°27' N latitude), 2) Southern South-Central RLMA (Point Conception to Lopez Point at 36° N latitude), 3) Northern South-Central RLMA (Lopez Point to Pigeon Point at 37º11' N latitude), 4) Northern Central RLMA (Pigeon Point to Cape Mendocino at 40°10' N latitude), and 5) Northern RLMA (Cape Mendocino to the California/Oregon Border at 42° N latitude). The RLMAs between Lopez Point and Cape Mendocino were combined in 2005-2006 management with the intent to specify separate management measures in each of these RLMAs as needed to stay within state and federal harvest guidelines.

The Council and NMFS adopted 2005-2006 California recreational management measures as follows:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Lingcod size limit of 24 inches with a daily bag limit of two fish.
- Within a general bag limit of 20 fish, a combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish of which one can be a cabezon and one can be a greenling of the genus *Hexagrammos*[4].
- A two-fish bag limit for bocaccio in the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude) and a one-fish bag limit south of 40°10' N latitude to the U.S./Mexico border within the 10-fish RCG daily bag limit.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- All divers (use of boats is permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

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4 The cabezon daily bag sublimit was changed from three fish to one fish and the greenling daily bag sublimit was changed from 2 fish to 1 fish in a California Fish and Game Commission action in October 2004 subsequent to the Council's final decision in June 2004. The Council and NMFS adopted conforming federal regulations that were implemented on April 1, 2005.

The California recreational fishery was managed with federal and state harvest guideline for various groundfish species. Federal annual harvest guidelines were specified for canary rockfish (9.3 mt), yelloweye rockfish (3.7 mt), black rockfish (316 mt for recreational and nearshore commercial fisheries combined in 2005, of which 175 mt were allocated to the recreational fishery by CDFG; in 2006, the combined harvest guideline was 309 mt and the recreational harvest guideline was 170 mt), and lingcod (422 mt) (Table 2-11). State harvest guidelines were specified by CDFG for cabezon, greenlings, and minor nearshore rockfish (both shallow and deeper nearshore rockfish species; see section 2.1.4.1 for the list of species in these complexes). If the recreational harvest guideline for canary rockfish, yelloweye rockfish, or lingcod specified for California was projected to be exceeded, or if the state harvest guideline for black rockfish was projected to be exceeded when combining recreational harvest projections and annual commercial projections, CDFG and/or the Council and NMFS would take action to close all or part of the recreational fishery in all or part of the state regions in all or part of the remainder of the year. Any closure may pertain to closure of specific groundfish species or specific depths in different regions to achieve catch limitation. In the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude), CDFG would take action to close all or part of the recreational fishery deeper than the 30 fm management line if the canary or yelloweye rockfish harvest guideline was attained early in the season.

The 2005 and 2006 adopted management measures included depth bands where fishing for rockfish and associated species was allowed only between 20 and 40 fm (Southern South-Central RLMA) or 30 to 60 fm (Southern RLMA). California took inseason action in 2005 to remove the shoreward boundaries of these depth bands and allow boat-based fishing inside the seaward boundaries originally adopted in the Southern and Southern South-Central RLMAs. These actions were initiated to address concerns related to the ability to enforce fishing restrictions shoreward of adopted depth bands. In addition, final 2004 recreational CRFS projections of impacts showed that additional opportunity could be allowed shoreward of the adopted boundaries, as well as in additional months in the North, North-Central and Northern South-Central RLMAs that would not be likely to exceed harvest guidelines for overfished species targets.

The 2005-2006 seasons and depth restrictions by California management region (Table 2-13) were as follows:

Table 2-13. Summary of 2006 California recreational groundfish seasons and depth restrictions by region under the No Action Alternative.

RCG SEASON BY REGION

<table>
<tr><th>Region</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North region</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="8">> 30fm Closed</td></tr>
<tr><td>North Central</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="6">> 20fm Closed</td></tr>
<tr><td>South Central - Monterey</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="6">> 20fm Closed</td></tr>
<tr><td>South Central - Morro Bay</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="5">> 40fm Closed</td><td>---</td><td>---</td><td>---</td></tr>
<tr><td>South Region</td><td>---</td><td>---</td><td colspan="6">> 60fm Closed</td><td colspan="2">>30 fm Closed</td><td colspan="2">> 60fm Closed</td></tr>
</table>

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

Southern RLMA (U.S./Mexico Border to Point Conception at 34°27' N latitude)

The California recreational groundfish fishery regulations south of Point Conception under the No Action Alternative were the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through August and November through December shoreward of 60 fm; open September through October shoreward of 30 fm; and closed January and February.
- California scorpionfish can only be retained during October and November shoreward of 40 fm and December shoreward of 20 fm (closed January through September).
- Fishing is allowed within the Cowcod Conservation Areas (Figure 2-3) shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

Southern South-Central RLMA (Point Conception to Lopez Point at 36° N latitude)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through September shoreward of 40 fm (closed January through April and October through December).

Northern South-Central RLMA (Lopez Point to Pigeon Point at 37°11' N latitude)

The California recreational groundfish fishery regulations for the area between Lopez Point and Cape Mendocino under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm (closed January through June).

Northern Central RLMA (Pigeon Point to Cape Mendocino at 40°10' N latitude)

Same regulations as in the Northern South-Central RLMA, except:

- Recreational fishing for groundfish prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.

Northern RLMA (Cape Mendocino to the California/Oregon Border at 42° N latitude)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 40 fm (closed January through June through April).

2.2.3.2 Action Alternative 1

Action Alternative 1 describes the suite of 2007-2008 management measures adopted by the Council for analysis in April 2006 which are the most conservative analyzed in this EIS and therefore tend to constrain fishing opportunities more than the other action alternatives analyzed. They are designed to stay within the Preferred Low OY Alternative for depleted groundfish species (see section 2.1.1.1). Table 2-14 depicts the impacts to depleted groundfish species by sector in 2007 and 2008 associated with the suite of management measures under Action Alternative 1.

2.2.3.2.1 Limited Entry Trawl Fisheries

Table 2-15 depicts the 2007-2008 limited entry trawl management measures under Action Alternative 1. Under this alternative, the trawl RCA is the largest considered for 2007-2008 extending out to the 250 fm in the north and 200 fm in the south (north of 38º N latitude) to stay within the Low Preferred OYs for darkblotched rockfish and Pacific ocean perch. The shoreward RCA line is also extended in to 75 fm in the north and 60-75 fm in the south to reduce mortalities on depleted shelf rockfish, such as bocaccio and canary rockfish, which is responsive to the Low Preferred OYs for those species.

Table 2-14. Projected mortality (mt) of depleted groundfish species by fishing sector under Action Alternative 1.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	9.1	3.7	0.2	66.7	32.4	0.1	0.1
Limited Entry Trawl- Whiting							0
At-sea whiting motherships		1.8		2.5	0.5	15.3	0.0
At-sea whiting cat-proc		0.4		3.3	1.6	26.5	0.0
Shoreside whiting		0.7		2.8	0.9	22.6	0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear							
Sablefish	0.2	0.1	0.1	1.0	0.2	0.0	0.4
Non-Sablefish	5.2	0.0		0.4	0.4	0.5	0.2
Open Access: Directed Groundfish							
Sablefish DTL	0.0	0.0	0.1	0.2	0.1	0.0	0.1
N 40 10 Nearshore	0.0	1.0		0.0	0.0	0.1	0.8
S 40 10 Nearshore	0.0			0.0	0.0		
Other	4.1	0.0		0.0	0.0	0.0	0.0
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		0.7					1.5
OR		1.6				0.1	1.6
CA	16.0	4.8	0.0			1.6	1.2
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	38.9	25.0	0.5	80.8	44.0	116.3	10.9
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	38.9	25.0	0.5	80.8	44.0	116.3	10.9
Low OY Alt	**40**	**32.0**	**4.0**	**130**	**44**	**120**	**12.6**
Difference	1.1	7.0	3.5	49.3	0.0	3.8	1.7
Percent of OY	97.3%	78.1%	12.5%	62.1%	100.1%	96.9%	86.6%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish.

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 2-15. Cumulative bimonthly limits and RCA configurations by area and species for the West Coast limited entry trawl fishery in 2007-2008 under Action Alternative 1.

RCA Configurations				Cumulative Limits							
SUBAREA	Period	INLINE	OUTLINE	SABLEFISH	LONGSPN	SHORTSPN	DOVER	OTHER FLAT	PETRALE	ARROWTH	SLOPE ROCK
North seaward limits	1	75	250*	10,000	4,000	3,000	50,000	25,000	50,000	5,000	2,000
	2	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	3	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	4	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	5	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	6	75	250*	10,000	4,000	3,000	50,000	25,000	50,000	5,000	2,000
North shoreward limits	1	75	250*	7,000	3,000	3,000	20,000	30,000	15,000	5,000	2,000
	2	75	250	7,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	3	75	250	8,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	4	75	250	8,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	5	75	250	7,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	6	75	250*	7,000	3,000	3,000	20,000	30,000	15,000	5,000	2,000
38 - 40 10	1	60	200*	12,000	10,000	5,000	50,000	52,000	50,000	5,000	4,000
	2	60	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	3	75	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	4	60	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	5	60	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	6	60	200*	12,000	10,000	5,000	50,000	52,000	50,000	5,000	4,000
S 38	1	60	150	12,000	10,000	5,000	50,000	52,000	50,000	5,000	40,000
	2	60	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	3	75	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	4	60	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	5	60	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	6	60	150	12,000	10,000	5,000	50,000	52,000	50,000	5,000	40,000

note: splitnose limits are the same as slope rock limits south of 40 degrees 10 minutes N latitude

* indicates petrale areas

Action Alternative 1 would reduce the lingcod minimum size limit from 24 inches to 20 inches north of 40°10' N latitude under this alternative.

Under Action Alternative 1, Yelloweye RCAs would be added, which would be closed to limited entry trawl fisheries, including midwater trawl, as defined by the following coordinates:

Washington Extension to the "C-Shaped" YRCA

Washington Department of Fish and Wildlife is proposing an extension to the status quo "C-Shaped" YRCA in waters off northern Washington, which is described as follows:

Beginning at 48°00.00' N latitude, 125°16.00' W longitude;
Then to 48°06.00' N latitude, 125°16.00' W longitude;
Then to 48°00.00' N latitude, 124°54.00' W longitude;
Then to 48°06.00' N latitude, 124°54.00' W longitude;
Then to 48°00.00' N latitude, 125°16.00' W longitude;
and back to the point of origin (Figure 2-6).

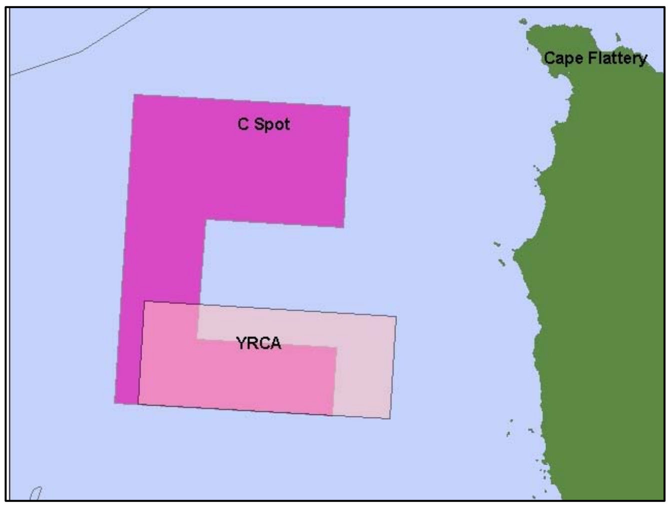

Figure 2-6. A proposed extension to the status quo Yelloweye Rockfish Conservation Area in waters off the Washington north coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

WA North Coast A

Beginning at 48°02.23’ N latitude; 125°17.87’ W longitude
Then to 48°01.42’ N latitude; 125°15.89’ W longitude
Then to 47°59.11’ N latitude; 125°18.03’ W longitude
Then to 47°59.97’ N latitude; 125°19.92’ W longitude
and back to the point of origin (Figure 2-7).

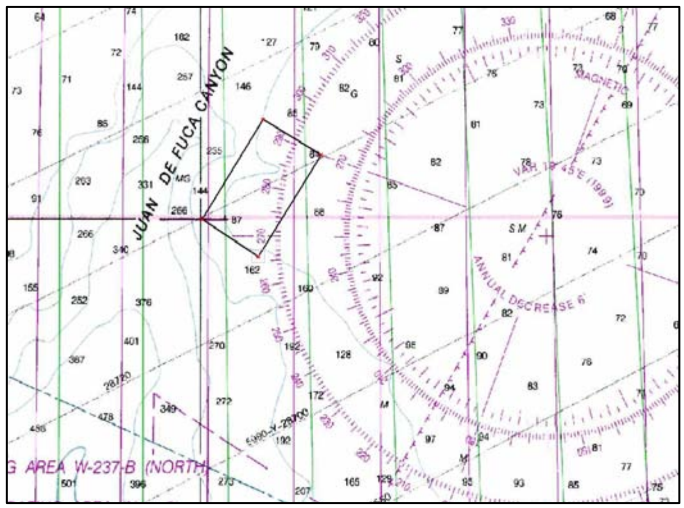

Figure 2-7. A proposed Yelloweye Rockfish Conservation Area (WA North Coast A) in waters off the Washington north coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

WA North Coast B

Beginning at 48º11.77’ N latitude by 125º13.03’ W longitude
Then to 48º16.43’ N latitude by 125º07.55’ W longitude
Then to 48º14.72’ N latitude by 125º01.84’ W longitude
Then to 48º13.36’ N latitude by 125º03.20’ W longitude
Then to 48º12.74’ N latitude by 125º05.83’ W longitude
Then to 48º11.55’ N latitude by 125º04.99’ W longitude
Then to 48º09.96’ N latitude by 125º06.63’ W longitude
Then to 48º09.68’ N latitude by 125º08.75’ W longitude
and back to the point of origin (Figure 2-8).

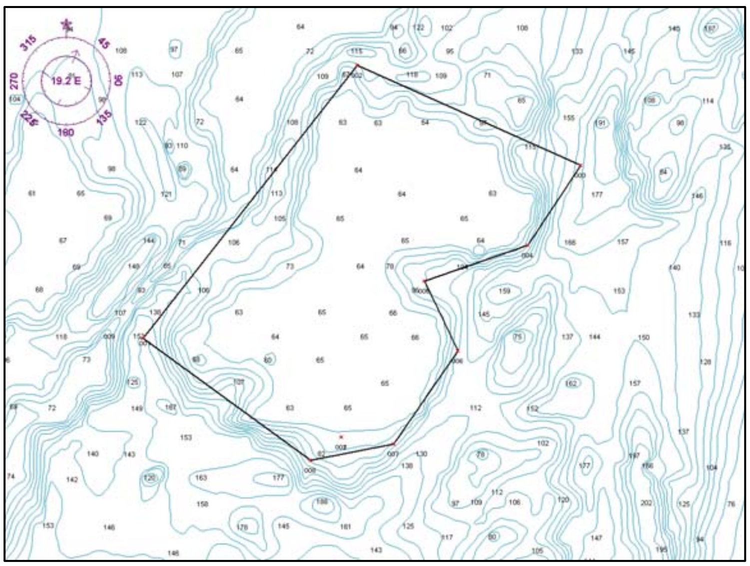

Figure 2-8. A proposed Yelloweye Rockfish Conservation Area (WA North Coast B) in waters off the Washington north coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

WA South Coast A

Beginning at 47°05.00’ N latitude; 124°46.50’ W longitude
Then to 47°04.00’ N latitude; 124°46.50’ W longitude
Then to 47°05.00’ N latitude; 124°48.00’ W longitude
and back to the point of origin (Figure 2-9).

WA South Coast B

Beginning at 46°58.00’ N latitude; 124°48.00’ W longitude
Then to 46°55.00’ N latitude; 124°48.00’ W longitude
Then to 46°58.00’ N latitude; 124°49.00’ W longitude
and back to the point of origin (Figure 2-9).

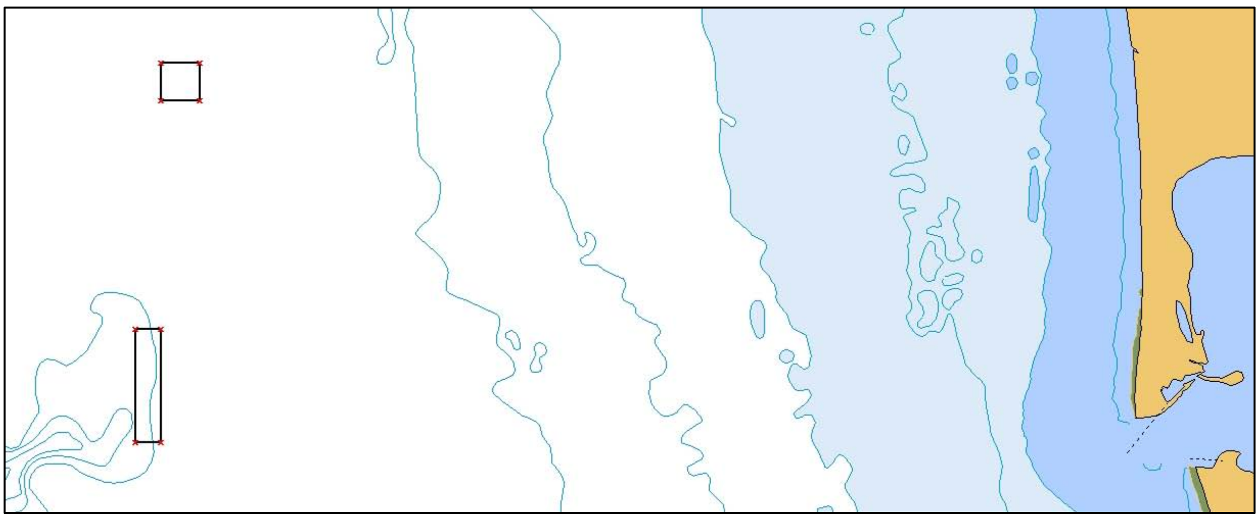

Figure 2-9. Two proposed Yelloweye Rockfish Conservation Areas (WA South Coast A and B) in waters off the Washington south coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

Non-Whiting Trawl Fishery

There are no additional management measures than those described above for non-whiting trawl fisheries in 2007 and 2008 under Action Alternative 1.

Whiting Trawl Fishery

Predicted impacts to depleted groundfish species in 2007-2008 whiting-directed fisheries under Action Alternatives 1-3 are depicted in Table 2-16. Higher whiting OYs are not possible given the bycatch constraints imposed by depleted groundfish species under the preferred OYs. However, it is important to note that an alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

Table 2-16. Predicted impacts to depleted groundfish species using a weighted average of observed bycatch rates in 2002-2005, sector whiting allocations, and estimated exvessel revenues for the 2007-2008 whiting fishery under Action Alternatives 1-3.

Action Alternatives	US Catch	Fathom Line	Sector	Allocation	Canary	Darkblotched	POP	Widow	Yelloweye	Exvessel Rev
Alt. 3	260,000	none	Tribal	35,000	1.6	0.0	0.6	6.0	-	$4,089,570.1
			Mothership	53,520	3.2	4.5	0.9	27.7	0.0	$6,253,536.9
			CP	75,820	0.7	6.0	2.8	48.1	0.0	$8,859,177.3
			Shoreside	93,660	1.3	5.0	1.7	41.0	0.0	$10,943,689.6
			Total		6.8	15.5	6.1	122.8	0.0	$30,145,973.9
Alt. 2	200,000	none	Tribal	27,500	1.2	0.0	0.5	4.8	-	$3,213,233.7
			Mothership	40,920	2.5	3.4	0.7	21.2	0.0	$4,781,291.7
			CP	57,970	0.5	4.6	2.2	36.8	0.0	$6,773,496.5
			Shoreside	71,610	1.0	3.8	1.3	31.3	0.0	$8,367,260.4
			Total		5.2	11.9	4.7	94.0	0.0	$23,135,282.3
Alt. 1	150,000	none	Tribal	25,000	1.1	0.0	0.5	4.3	-	$2,921,121.5
			Mothership	29,520	1.8	2.5	0.5	15.3	0.0	$3,449,260.3
			CP	41,820	0.4	3.3	1.6	26.5	0.0	$4,886,452.0
			Shoreside	51,660	0.7	2.8	0.9	22.6	0.0	$6,036,205.5
			Total		4.0	8.6	3.5	68.7	0.0	$17,293,039.3

2.2.3.2.2 Limited Entry Fixed Gear Fisheries

Under Action Alternative 1, the seaward line of the non-trawl RCA is extended out to 150 fm north of Pt. Conception at 34°27' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry fixed gear fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

South of Pt. Conception, the non-trawl RCA would be extended shoreward to 40 fm and seaward to 180 fm to reduce canary, cowcod, yelloweye, and particularly bocaccio mortality under this alternative.

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow limited entry fixed gear vessels access to fish in four distinct Groundfish Fishing Areas (GFAs) deeper than 175 fm (Figure 2-10).

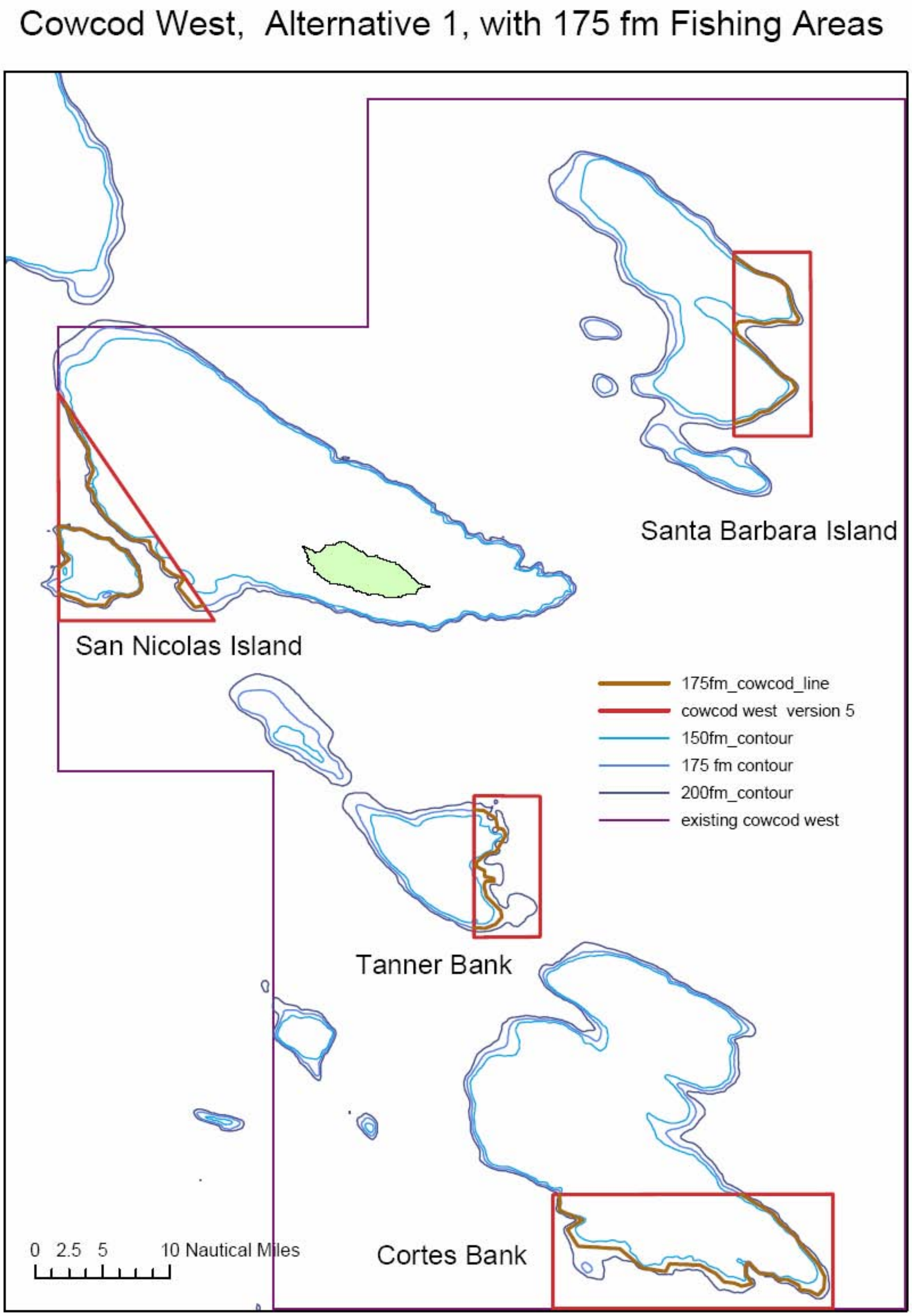

Figure 2-10. Modifications proposed for the western Cowcod Conservation Area in the Southern California Bight under Action Alternative 1 to allow limited entry fixed gear and open access fishing in four distinct Groundfish Fishing Areas (inside red polygons) in depths greater than 175 fm (brown contour).

.2.3.2.3 Open Access Fisheries

Under Action Alternative 1, the seaward line of the non-trawl RCA is extended out to 150 fm north of Pt. Conception at 34°27' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection. The proposed yelloweye RCAs off the Washington coast would also be closed to open access fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

South of Pt. Conception, the non-trawl RCA would be extended shoreward to 40 fm and seaward to 180 fm to reduce canary, cowcod, yelloweye, and particularly bocaccio mortality under this alternative.

Directed Groundfish Fisheries

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow open access vessels targeting groundfish using fixed gears access to fish in four distinct Groundfish Fishing Areas (GFAs) deeper than 175 fm (Figure 2-10).

Incidental Groundfish Fisheries

An additional yelloweye RCA is considered under Action Alternative 1 (as well as Action Alternatives 2 and 3) where commercial salmon trolling would be prohibited (Figure 2-11). This salmon troll RCA is defined by the following coordinates:

Beginning at 48°00.00’ N latitude by 125°14.00’ W longitude
Then to 48°02.00’ N latitude by 125°14.00’ W longitude
Then to 48°00.00’ N latitude by 125°16.50’ W longitude
and back to the point of origin.

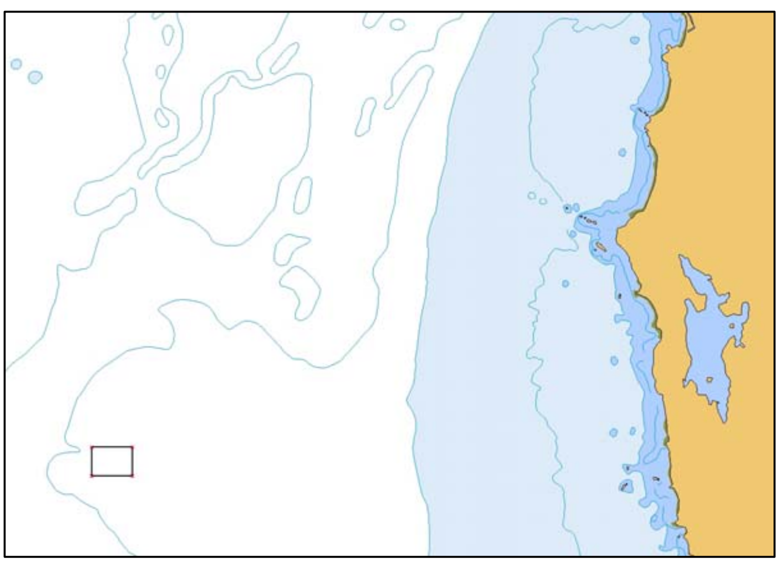

Figure 2-11. A yelloweye RCA off the north Washington coast where commercial salmon trolling would be prohibited under Action Alternatives 1-3.

Under Action Alternative 1, the following management measures would also apply to the commercial salmon troll fishery north of 40°10' N latitude:

- Consistent with the salmon troll regulations off Oregon, allow the retention of lingcod in the salmon troll fishery when fishing shoreward of a line approximating 30 fm.
- As a canary rockfish bycatch reduction measure, prohibit the use of "hoochies" on the bottom spread.

2.2.3.2.4 Nearshore Commercial Fisheries

Nearshore Commercial Fisheries North of 40°10' N latitude

Under Action Alternative 1, the shoreward non-trawl RCA boundary is adjusted from 30 fm (status quo) to 20 fm from 40°10' N latitude to the Oregon-Washington border at 46°16' N latitude (Table 2-12). In addition, the harvestable amount of black rockfish available to this fishery is reduced from status quo levels by 60%. As current trip limits are at the minimum level deemed viable by the fishery participants, a 60 % reduction in target catch would result in a 60% reduction in season duration (< than a 6 month season). The same magnitude of reduced catch may also be attained by utilizing one, or a combination of, the following options: 1) restricting the fishery to waters shoreward of 10 or 15 fm; 2) reducing the duration of the fishery, resulting in a very short season; 3) a fishery closure in some or all areas; and/or 4) reduced harvest of target species.

Nearshore Commercial Fisheries South of 40°10' N latitude

Under Action Alternative 1 from 40°10' N latitude 34°27' N latitude, the shoreward non-trawl RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 20 fm during all periods (Table 2-12b). In addition, the harvestable amount of shallow and deeper nearshore rockfish available to this fishery is reduced from status quo levels by 15%. As current trip limits are at the minimum level deemed viable by the fishery participants, a 15% reduction in target catch would result in a 15% reduction in season duration (i.e., an 8 month season). The same magnitude of reduced catch may also be attained by utilizing one, or a combination of, the following options: 1) restricting the fishery to waters shoreward of 10 or 15 fm; 2) reducing the duration of the fishery, resulting in a very short season; 3) a fishery closure in some or all areas; and/or 4) further reduced harvest of target species. Under Action Alternative 1 from 34°27' N latitude to the U.S./Mexico border, the shoreward non-trawl RCA boundary is adjusted from 60 fm (status quo) to 40 fm. The same magnitude of reduced catch may also be attained by utilizing one, or a combination of, the following options: 1) restricting the fishery to waters shoreward of 30 or 20 fm; 2) reducing the duration of the fishery, resulting in a very short season; 3) a fishery closure in some or all areas; and/or 4) reduced harvest of target species.

2.2.3.2.5 Tribal Fisheries

Under all the action alternatives, the following regulations will apply to 2007-2008 tribal groundfish fisheries.

Black Rockfish - The 2007 and 2008 tribal harvest guidelines will be set at 20,000 pounds for the management area between the US/Canada border and Cape Alava, and 10,000 pounds for the management area located between Destruction Island and Leadbetter Point. No tribal harvest restrictions are proposed for the management area between Cape Alava and Destruction Island.

Sablefish - The 2007 and 2008 tribal set asides for sablefish will be set at 10 percent of the Monterey through Vancouver area OY minus 1.9 percent to account for estimated discard mortality. Allocations among tribes and among gear types, if any, will be determined by the tribes.

Pacific cod - The tribes will be subject to a 400 mt harvest guideline for 2007 and 2008.

For all other tribal groundfish fisheries the following trip limits will apply:

Thornyheads - Tribal fisheries will be restricted to the Limited Entry trip limits in place at the beginning of the year for both shortspine and longspine thornyheads.

Canary Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit.

Other Minor Nearshore, Shelf and Slope Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit for each species group, or the limited entry trip limits if they are less restrictive than the 300 pound per trip limit.

Yelloweye Rockfish - The tribes will continue developing depth, area, and time restrictions in their directed Pacific halibut fishery to minimize impacts on yelloweye rockfish. Tribal fisheries will be restricted to 100 pounds per trip.

Spiny Dogfish - The Makah Tribe is proposing a directed longline fishery for spiny dogfish for 2007 and 2008. The fishery would be restricted to the Limited Entry trip limits. Increased landings of dogfish by treaty fishermen in 2007 and 2008 would be dependent on successful targeting in 2006 while staying within current estimates of impacts on overfished species.

Full Retention - The tribes will require full retention of all overfished rockfish species as well as all other marketable rockfishes during treaty fisheries.

Tribal Proposals Regarding Makah Trawl fisheries for 2007 and 2008

Midwater Trawl Fishery - Treaty midwater trawl fishermen will be restricted to a cumulative limit of yellowtail rockfish, based on the number of vessels participating, not to exceed 180,000 pounds per two month period for the entire fleet. Their landings of widow rockfish must not exceed 10 percent of the poundage of yellowtail rockfish landed in any given period. The tribe may adjust the cumulative limit for any two-month period to minimize the incidental catch of canary and widow rockfish, provided the average cumulative limit does not exceed 180,000 pounds for the fleet.

Bottom Trawl Fishery - Treaty fishermen using bottom trawl gear will be subject to the trip limits applicable to the limited entry fishery for Dover sole, English sole, rex sole, arrowtooth flounder, and other flatfish. For petrale sole, fishermen would be restricted to 50,000 pounds per two month period for the entire year. Because of the relatively modest expected harvest, the trip limits for the tribal fishery will be those in place at the beginning of the season in the limited entry fishery and will not be adjusted downward, nor will time restrictions or closures be imposed, unless in-season catch statistics demonstrate that the tribe has taken half of the harvest in the tribal area. Fishermen will be restricted to small footrope ($\leq$ 8 inches) trawl gear. Exploration of the use of selective flatfish trawl gear will be conducted in 2006.

Observer Program - The Makah Tribe has an observer program in place to monitor and enforce the limits proposed above.

2.2.3.2.6 Washington Recreational Fisheries

Under Action Alternative 1, WDFW is not proposing any changes to the bottomfish bag limit, minimum size limits, or lingcod season dates described under the No Action Alternative. However, the proposed yelloweye RCAs off the Washington coast would also be closed to Washington recreational fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8). These additional yelloweye RCAs would require a change to the Pacific Halibut Catch Sharing Plan. Other new management measures are considered under Action Alternative 1 as follows:

Management Measures for Marine Areas 3 and 4 (Queets River to the U.S./Canada border)

Under Action Alternative 1, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 10 fm during the months of May, August, and September; close the North Coast to halibut fishing, except in Area 4B; and prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from June 1 through July 31. This alternative would require a change to the Pacific Halibut Catch Sharing Plan.

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Under Action Alternative 1, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 30 fm from lingcod opening day through July 31; prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from August 1 through September 30.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

There is very little yelloweye and canary rockfish (0.03 mt and 0.02 mt, respectively, in 2005) caught in Marine Area 1; therefore, WDFW proposes to keep the status quo (No Action) bottomfish fishing regulations in place through 2007 and 2008.

2.2.3.2.7 Oregon Recreational Fisheries

Under Action Alternative 1a (there are two suboptions for the 2007-2008 Oregon recreational fishery under Action Alternative 1), the Oregon recreational groundfish fishery would only be open in depths ≤20 fm from July 1 through Labor Day. The minimum size limit for lingcod would be 20-inches, and anglers would be allowed to retain 3 lingcod per day. Minimum size limits for cabezon and greenling species would be the same as for the No Action Alternative. However, under this alternative the marine fish daily bag limit would increase to 10 marine fish, with all other regulations the same as in the No Action Alternative, except for the following expansion of the Stonewall Banks closure in the Pacific halibut fishery. The additional closure, designed to reduce yelloweye rockfish mortality and hence termed a yelloweye RCA (YRCA), is defined by the following coordinates:

1	44º41.71 N latitude	124º29.99 W longitude
2	44º41.68 N latitude	124º21.60 W longitude
3	44º27.66 N latitude	124º17.01 W longitude
4	44º25.22 N latitude	124º17.01 W longitude
5	44º25.27 N latitude	124º30.11 W longitude

Returning to the first point (Figure 2-5).

This expanded Stonewall Banks closure would only apply to the Pacific halibut fishery since this area is seaward of the 20 fm line and, under this alternative, all groundfish retention is prohibited seaward of the 20 fm line.

Under Action Alternative 1b, the Oregon recreational groundfish fishery would be open from April through September shoreward of the 20 fm line. A 30% reduction in yelloweye rockfish impacts would be achieved by reducing Pacific halibut quota and time on the water in that fishery. The marine fish daily bag limit would be the same as under the No Action Alternative, or 6 marine fish daily. The minimum size limit for lingcod would be 20 inches, and anglers would be allowed to retain 3 lingcod per day. All other groundfish regulations would be the same as under the No Action Alternative except for the expansion of the Stonewall Banks closure in the Pacific halibut fishery described under Action Alternative 1a.
This expanded Stonewall Banks closure would only apply to the Pacific halibut fishery since this area is seaward of the 20 fm line and, under this alternative, all groundfish retention is prohibited seaward of the 20 fm line.

Predicted yelloweye rockfish impacts under both alternatives 1a and 1b are similar (see section 4.3.1.7).

2.2.3.2.8 California Recreational Fisheries

Under Action Alternative 1, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 1 include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Within a general bag limit of 20 fish, a combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish, of which one can be a cabezon and one can be a greenling of the genus *Hexagrammos*.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

California recreational groundfish management measures that differ from status quo under Action Alternative 1 include the following:

- A statewide one-fish bocaccio sublimit is included in the 10-fish RCG daily bag limit.
- Lingcod daily bag limit of 1 fish, but with a minimum size limit of 22 inches.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 1 are described below and summarized in Table 2-17.

- Fishing is allowed within the Cowcod Conservation Areas shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

Table 2-17. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 1.

RCG SEASON BY REGION:

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 20fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed			---	> 20fm Closed	
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	---	> 20fm Closed					---	---	---
South Region*	---	---	> 30fm Closed									

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-February and 0-30 fm March-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 1 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through December shoreward of the 30 fm line and otherwise closed.
- California scorpionfish is open year-round, but restricted to depths ≤40 fm during January and February, and ≤30 fm during March through December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through September shoreward of the 20 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Pigeon Point under the Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through September and November through December shoreward of 20 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 20 fm and otherwise closed.

2.2.3.3 Action Alternative 2

Action Alternative 2 is intermediate to Action Alternatives 1 and 3 in constraints to 2007 and 2008 fishing opportunities and intermediate in terms of impacts to depleted and target groundfish species. Table 2-19 depicts the impacts to depleted groundfish species by sector in 2007 and 2008 associated with the suite of management measures under Action Alternative 2.

2.2.3.3.1 Limited Entry Trawl Fisheries

Table 2-18 depicts the 2007-2008 limited entry trawl management measures under Action Alternative 2. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry trawl fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Table 2-18. Cumulative bimonthly limits and RCA configurations by area and species for the West Coast limited entry trawl fishery in 2007-2008 under Action Alternative 2.

		RCA Configurations		Cumulative Limits							
SUBAREA	Period	INLINE	OUTLINE	SABLEFISH	LONGSPN	SHORTSPN	DOVER	OTHER FLAT	PETRALE	ARROWTH	SLOPE ROCK
North seaward limits	1	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
	2	75	200	14,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	3	75	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	4	75	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	5	75	200	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	6	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
North shoreward limits	1	75	200*	5,000	3,000	3,000	40,000	80,000	16,000	80,000	4,000
	2	75	200	9,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	3	75	250	11,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	4	75	250	11,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	5	75	200	9,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	6	75	200*	5,000	3,000	3,000	40,000	80,000	16,000	80,000	4,000
38 - 40 10	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
S 38	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000

note: splitnose limits are the same as slope rock limits south of 40 degrees 10 minutes N latitude

* indicates petrale areas

Action Alternative 2 would reduce the lingcod minimum size limit from 24 inches to 22 inches north of 40°10' N latitude under this alternative.

Table 2-19. Projected mortality (mt) of depleted groundfish species by fishing sector under Action Alternative 2.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Y'eye '07	*Y'eye '08*
Limited Entry Trawl- Non-whiting	50.5	7.5	2.9	179.6	85.6	1.0	0.2	*0.2*
Limited Entry Trawl- Whiting								
At-sea whiting motherships		2.5		3.4	0.7	21.2	0.0	*0.0*
At-sea whiting cat-proc		0.5		4.6	2.2	36.8	0.0	*0.0*
Shoreside whiting		1.0		3.8	1.3	31.3	0.0	*0.0*
Tribal whiting		1.6		0.0	0.6	6.1	0.0	*0.0*
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	*0.0*
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	*0.0*
Troll		0.5		0.0	0.0		0.0	*0.0*
Fixed gear		0.3		0.0	0.0	0.0	2.3	*2.3*
Limited Entry Fixed Gear								
Sablefish	13.4	0.3	0.1	0.7	0.3	0.0	0.8	*0.8*
Non-Sablefish		0.2		0.4	0.4	0.5	0.6	*0.6*
Open Access: Directed Groundfish								
Sablefish DTL	0.0	0.1	0.1	0.2	0.1	0.0	0.2	*0.2*
N 40 10 Nearshore	0.0	1.5		0.0	0.0	0.1	1.3	*1.3*
S 40 10 Nearshore	0.0			0.0	0.0			
Other	10.6	0.0		0.0	0.0	0.0	0.0	*0.0*
Limited Entry Fixed Gear								
Open Access: Directed Groundfish								
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	*0.0*
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	*0.1*
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	*0.5*
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Spot Prawn (trap)								
Recreational Groundfish								
WA		0.8					1.8	*1.8*
OR		2.6				0.1	1.9	*1.9*
CA	31.7	5.9	0.1			3.2	1.5	*1.5*
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	*3.0*
Non-EFP Total	110.5	33.1	3.3	196.6	98.5	143.7	14.3	*14.3*
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
TOTAL	110.5	33.1	3.3	196.6	98.5	143.7	14.3	*14.3*
High OY Alt	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	***20***
Difference	107.5	10.9	4.7	32.5	1.5	224.4	8.7	*5.7*
Percent of OY	50.7%	75.2%	41.3%	85.8%	98.5%	39.0%	62.0%	*71.3%*
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.
b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish.

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Non-Whiting Trawl Fishery

There are no additional management measures than those described above for non-whiting trawl fisheries in 2007 and 2008 under Action Alternative 2.

Whiting Trawl Fishery

Predicted impacts to depleted groundfish species in 2007-2008 whiting-directed fisheries under Action Alternatives 1-3 are depicted in Table 2-16. Higher whiting OYs are not possible given the bycatch constraints imposed by depleted groundfish species under the preferred OYs. However, it is important to note that an alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

2.2.3.3.2 Limited Entry Fixed Gear Fisheries

Under Action Alternative 2, the seaward line of the non-trawl RCA is extended out to 125 fm north of Cape Mendocino at 40°10' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection relative to status quo management measures. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry fixed gear fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow limited entry fixed gear vessels access to fish in depths deeper than 175 fm (Figure 2-12).

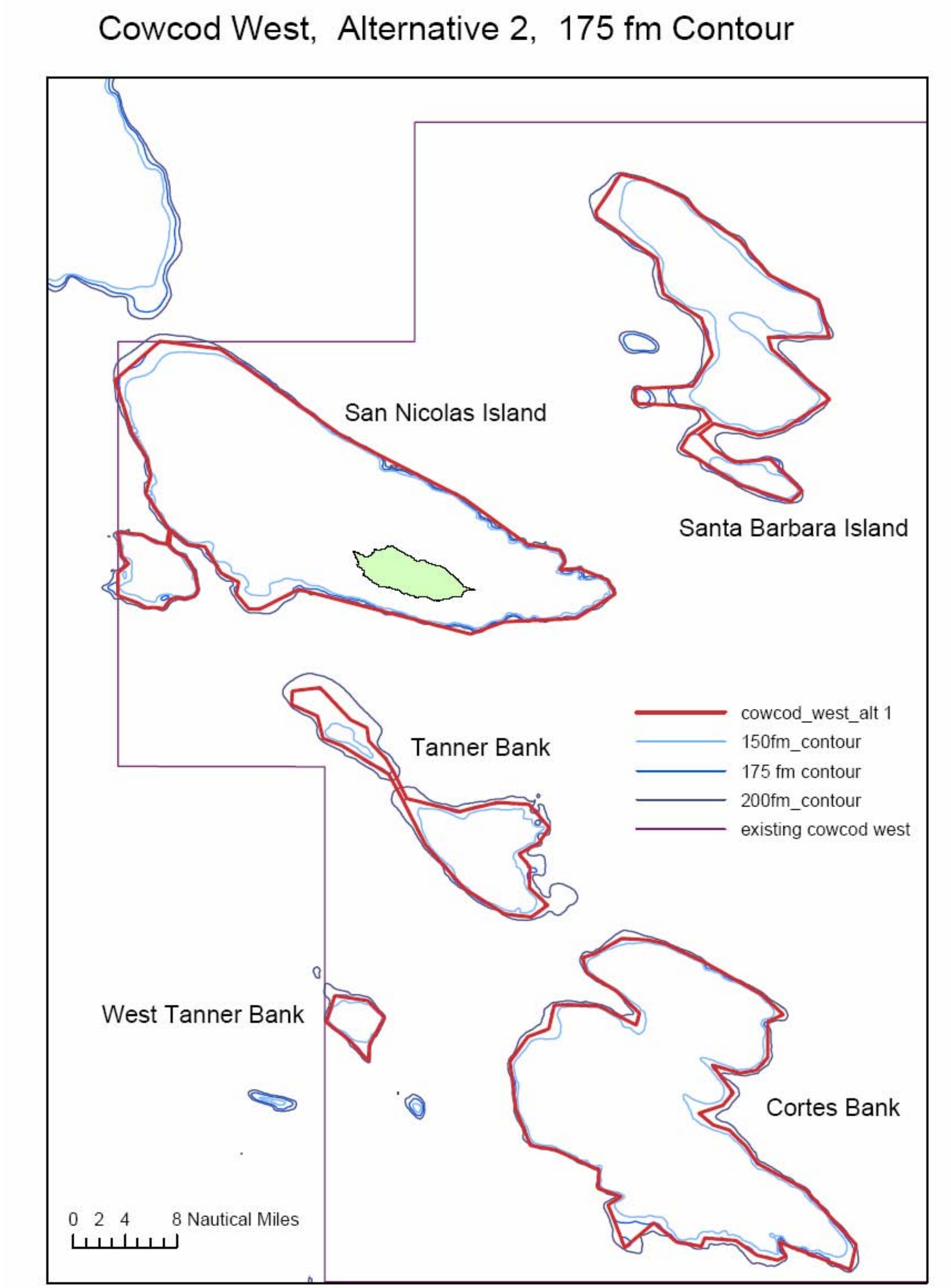

Figure 2-12. Modifications proposed for the western Cowcod Conservation Area in the Southern California Bight under Action Alternative 2 to allow limited entry fixed gear and open access fishing in depths greater than 175 fm (red contour).

2.2.3.3.3 Open Access Fisheries

Under Action Alternative 2, the seaward line of the non-trawl RCA is extended out to 125 fm north of Cape Mendocino at 40°10' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection relative to status quo management measures. The proposed yelloweye RCAs off the Washington coast would also be closed to open access fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Directed Groundfish Fisheries

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow open access vessels targeting groundfish using fixed gears access to fish in depths deeper than 175 fm (Figure 2-12).

Incidental Groundfish Fisheries

Additional management measures to those described above considered for open access fisheries that incidentally catch groundfish species under this alternative apply to the commercial salmon troll fishery north of 40°10' N latitude as follows:
Under Action Alternative 1, the following management measures would also apply to the commercial salmon troll fishery north of 40°10' N latitude:

- Prohibit commercial salmon trolling in the proposed yelloweye RCA in waters off northern Washington described under Action Alternative 1 (Figure 2-11).
- Prohibit the retention of lingcod in the salmon troll fishery shoreward of the non-trawl RCA seaward boundary (e.g., shoreward of 100 fm north of 40°10’ N latitude, under status quo).
- As a canary rockfish bycatch reduction measure, prohibit the use of “hoochies” on the bottom spread.

2.2.3.3.4 Nearshore Commercial Fisheries

Nearshore Commercial Fisheries North of 40°10' N latitude

Under Action Alternative 2, the shoreward RCA boundary is adjusted from 30 fm (status quo) to 20 fm from 40°10' N latitude to the Oregon-Washington border at 46°16' N latitude (Table 2-12). In addition, the harvestable amount of black rockfish available to this fishery is reduced from status quo levels by 10%. The same amount of savings may occur by further adjustment of the shoreward RCA boundary (i.e. 15 fm), resulting in status quo harvest of target species.

Nearshore Commercial Fisheries South of 40°10' N latitude

Under Action Alternative 2, from 40°10' N latitude 34°27’ N latitude, the shoreward non-trawl RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 20 fm during all periods (Table 2-12b). In addition, the harvestable amount of shallow and deeper nearshore rockfish available to this fishery is reduced from status quo levels by 5%. The same amount of savings may occur by further adjustment of the shoreward RCA boundary (i.e. 15 fm), or reducing the season duration (9 months), resulting in status quo harvest of target species. Action Alternative 2 from 34°27’ N latitude to the US/Mexico border represents status quo management. CDFG would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Director of CDFG or by the California Fish and Game Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

2.2.3.3.5 Tribal Fisheries

Groundfish management measures are the same as described for tribal fisheries under Action Alternative 1. The tribes proposed only one action alternative for analysis.

2.2.3.3.6 Washington Recreational Fisheries

Under Action Alternative 2, WDFW is not proposing any changes to the bottomfish bag limit, minimum size limits, or lingcod season dates described under the No Action Alternative. However, the proposed yelloweye RCAs off the Washington coast would also be closed to Washington recreational fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8). These additional yelloweye RCAs would require a change to the Pacific Halibut Catch Sharing Plan. Other new management measures are considered under Action Alternative 2 as follows:

Management Measures for Marine Areas 3 and 4 (Queets River to the U.S./Canada border)

Under Action Alternative 2, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 10 fm during the months of May and September; close the North Coast to halibut fishing, except in Area 4B; and prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from June 1 through August 31. This alternative would require a change to the Pacific Halibut Catch Sharing Plan.

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Under Action Alternative 2, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 30 fm from lingcod opening day through August 31.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

There is very little yelloweye and canary rockfish (0.03 mt and 0.02 mt, respectively, in 2005) caught in Marine Area 1; therefore, WDFW proposes to keep the status quo (No Action) bottomfish fishing regulations in place through 2007 and 2008.

2.2.3.3.7 Oregon Recreational Fisheries

Under Action Alternative 2, the Oregon recreational groundfish fishery would be open all year shoreward of the 20 fm line. The marine fish daily bag limit would be reduced to 5 marine fish. Other changes to status quo (No Action) management measures under this alternative include a decrease in the lingcod minimum size limit to 22 inches. All other management measures, including the current Stonewall Banks closure for the Pacific halibut fishery under this alternative are the same as under the No Action Alternative. The additional YRCA contemplated under Action Alternative 1 would not apply to the directed recreational groundfish fishery under this alternative since the proposed closed area is seaward of the 20 fm line.

2.2.3.3.8 California Recreational Fisheries

Under Action Alternative 2, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 2 include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish.
- No retention of cowcod, canary, or yelloweye rockfish.
- Lingcod size limit of 24 inches with a daily bag limit of two fish.
- A two-fish bocaccio sublimit included in the 10-fish RCG daily bag limit.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

California recreational groundfish management measures that differ from status quo under Action Alternative 2 include the following:

- Two cabezon and two greenling of the genus *Hexagrammos* sublimit is included in the 10-fish RCG daily bag limit.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 2 are described below and summarized in Table 2-20.

Table 2-20. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 2.

RCG SEASON BY REGION

Region	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
North region	---	---	---	---	>30fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed					
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	> 20fm Closed						---	---	---
South Region*	---	---	> 40fm Closed						> 30fm Closed		> 60fm Closed	

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-August, 0-30 fm September-October and 0-60 fm November-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 2 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through August shoreward of the 40 fm line, September through October shoreward of the 30 fm line, November and December shoreward of the 60 fm line, and otherwise closed.
- California scorpionfish is open year-round, but restricted to depths ≤40 fm during January-August, ≤30 fm during September and October, and ≤60 fm during November and December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open April through September shoreward of the 20 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Cape Mendocino under the Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 30 fm and otherwise closed.

2.2.3.4 Action Alternative 3

Action Alternative 3 is the most liberal action alternative analyzed in this EIS. More fishing opportunities, and hence greater impacts to groundfish species, are predicted under this alternative. The only other alternative analyzed that may be less constraining to 2007-2008 fishing opportunities may be the No Action Alternative, if those management measures were implemented in the next management cycle. Table 2-21 depicts the impacts to depleted groundfish species by sector in 2007 and 2008 associated with the suite of management measures under Action Alternative 3.

2.2.3.4.1 Limited Entry Trawl Fisheries

Table 2-22 depicts the 2007-2008 limited entry trawl management measures under Action Alternative 3. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry trawl fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Under Action Alternative 3, the boundaries of the Cowcod Conservation Areas in the Southern California Bight would be eliminated and the depth-based RCAs specified for south of Pt. Conception would instead be implemented in this area.

Non-Whiting Trawl Fishery

There are no additional management measures than those described above for non-whiting trawl fisheries in 2007 and 2008 under Action Alternative 3.

Whiting Trawl Fishery

Predicted impacts to depleted groundfish species in 2007-2008 whiting-directed fisheries under Action Alternatives 1-3 are depicted in Table 2-16. Higher whiting OYs are not possible given the bycatch constraints imposed by depleted groundfish species under the preferred OYs. However, it is important to note that an alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

2.2.3.4.2 Limited Entry Fixed Gear Fisheries

Status quo management measures are specified for limited entry fixed gear fisheries under this alternative, except the proposed yelloweye RCAs off the Washington coast would also be closed to limited entry fixed gear fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Under Action Alternative 3, the boundaries of the Cowcod Conservation Areas in the Southern California Bight would be eliminated and the depth-based RCAs specified for south of Pt. Conception would instead be implemented in this area.

Table 2-21. Projected mortality (mt) of depleted groundfish species by fishing sector under Action Alternative 3.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Y'eye '07	*Y'eye '08*
Limited Entry Trawl- Non-whiting	50.5	8.5	2.9	181.1	85.9	1.0	0.2	*0.2*
Limited Entry Trawl- Whiting								
At-sea whiting motherships		3.4		4.7	0.9	28.8	0.0	*0.0*
At-sea whiting cat-proc		0.7		6.3	2.8	50.0	0.0	*0.0*
Shoreside whiting		1.4		5.2	1.7	42.6	0.0	*0.0*
Tribal whiting		1.6		0.0	0.6	6.1	0.0	*0.0*
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	*0.0*
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	*0.0*
Troll		0.5		0.0	0.0		0.0	*0.0*
Fixed gear		0.3		0.0	0.0	0.0	2.3	*2.3*
Limited Entry Fixed Gear								
Sablefish	13.4	0.5	0.1	0.6	0.2	0.0	1.0	*1.0*
Non-Sablefish		0.4		0.5	0.4	0.5	1.3	*1.3*
Open Access: Directed Groundfish								
Sablefish DTL	0.0	0.1	0.1	0.2	0.1	0.0	0.3	*0.3*
OR Nearshore	0.0	2.0		0.0	0.0	0.1	2.3	*2.3*
CA Nearshore	0.0			0.0	0.0			
Other	10.6	0.0		0.0	0.0	0.0	0.0	*0.0*
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	*0.0*
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	*0.1*
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	*0.5*
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Spot Prawn (trap)								
Recreational Groundfish								
WA		1.4					3.1	*3.1*
OR		4.0				0.6	2.9	*2.9*
CA	106.8	8.6	0.3			18.3	1.3	*1.3*
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	*3.0*
Non-EFP Total	185.6	41.1	3.5	202.5	100.0	191.4	18.3	18.3
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
TOTAL	185.6	41.1	3.5	202.5	100.0	191.4	18.3	*18.3*
High OY Alt	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	***20***
Difference	32.4	2.9	4.5	26.6	0.0	176.6	4.7	*1.7*
Percent of OY	85.1%	93.5%	43.8%	88.4%	100.0%	52.0%	79.7%	*91.7%*
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish.

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 2-22. Cumulative bimonthly limits and RCA configurations by area and species for the West Coast limited entry trawl fishery in 2007-2008 under Action Alternative 3.

		RCA Configurations		Cumulative Limits							
SUBAREA	Period	INLINE	OUTLINE	SABLEFISH	LONGSPN	SHORTSPN	DOVER	OTHER FLAT	PETRALE	ARROWTH	SLOPE ROCK
North seaward limits	1	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
	2	75	200	14,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	3	100	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	4	100	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	5	75	200	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	6	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
North shoreward limits	1	75	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	4,000
	2	100	200	9,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	3	100	250	11,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	4	100	250	11,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	5	100	200	9,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	6	100	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	4,000
38 - 40 10	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
S 38	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000

note: splitnose limits are the same as slope rock limits south of 40 degrees 10 minutes N latitude

* indicates petrale areas

2.2.3.4.3 Open Access Fisheries

Status quo management measures are specified for open access fisheries under this alternative, except the proposed yelloweye RCAs off the Washington coast would also be closed to open access fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8) and the following:

Under Action Alternative 3, the boundaries of the Cowcod Conservation Areas in the Southern California Bight would be eliminated and the depth-based RCAs specified for south of Pt. Conception would instead be implemented in this area.

Directed Groundfish Fisheries

There are no additional management measures considered for open access fisheries targeting groundfish species than those described above under this alternative.

Incidental Groundfish Fisheries

Additional management measures to those described above considered for open access fisheries that incidentally catch groundfish species under this alternative apply to the commercial salmon troll fishery north of 40°10' N latitude as follows:

- Prohibit commercial salmon trolling in the proposed yelloweye RCA in waters off northern Washington described under Action Alternative 1 (Figure 2-11).
- Allow the retention of lingcod in the salmon troll fishery, subject to an incidental landing ratio of one lingcod per ten Chinook salmon (Option 3a), or
- Allow the retention of lingcod in the salmon troll fishery, subject to an incidental landing ratio of one lingcod per ten Chinook salmon, north of the Oregon/Washington border at 46°16.00' N latitude (Option 3b).
- As a canary rockfish bycatch reduction measure, prohibit the use of "hoochies" on the bottom spread.

2.2.3.4.4 Nearshore Commercial Fisheries

Nearshore Commercial Fisheries North of 40°10' N latitude

There are two suboptions (Action Alternatives 3a and 3b) for nearshore commercial fisheries from 40°10' N latitude to the Oregon-Washington border at 46°16' N latitude.

Under Action Alternative 3a, the shoreward RCA boundary is adjusted from 30 fm (status quo) to 20 fm with no reduction to the amount of target catch (Table 2-12). Target species harvest levels would be set at levels consistent with adopted ABC/OY levels for those species. ODFW would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Oregon Fish and Wildlife Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

Action Alternative 3b represents a near status quo fishery (Table 2-12). The shoreward RCA boundary is established at 30 fm (status quo). Target species harvest levels would be set at levels consistent with adopted ABC/OY levels for those species. ODFW would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Oregon Fish and Wildlife Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

Nearshore Commercial Fisheries South of 40°10' N latitude

There are two suboptions (Action Alternatives 3a and 3b) for nearshore commercial fisheries from 40°10' N latitude to 34°27' N latitude.

Under Action Alternative 3a, the shoreward RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 30 fm during all periods. In addition, the harvestable amount of shallow and deeper nearshore rockfish available to this fishery is reduced from status quo levels by 5% (Table 2-12b). This represents near-status quo impacts to canary rockfish.

Under Action Alternative 3b, from 40°10' N latitude 34°27' N latitude, the shoreward non-trawl RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 30 fm during all periods (Table 2-12b). Target species harvest levels would be set at levels consistent with adopted ABC/OY levels for those species.

In both cases, CDFG would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Director of CDFG or by the California Fish and Game Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

Action Alternative 3 from 34°27’ N latitude to the US/Mexico border represents status quo management. CDFG would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Director of CDFG or by the California Fish and Game Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

2.2.3.4.5 Tribal Fisheries

Groundfish management measures are the same as described for tribal fisheries under Action Alternative 1. The tribes proposed only one action alternative for analysis.

2.2.3.4.6 Washington Recreational Fisheries

Under Action Alternative 3, WDFW is not proposing any changes to the bottomfish bag limit, minimum size limits, or lingcod season dates described under the No Action Alternative. Under this alternative, WDFW would reduce the lingcod minimum size limit to 20 inches in Marine Areas 1-4. The proposed yelloweye RCAs off the Washington coast would also be closed to Washington recreational fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8). These additional yelloweye RCAs would require a change to the Pacific Halibut Catch Sharing Plan. Other new management measures are considered under Action Alternative 3 as follows:

Management Measures for Marine Areas 3 and 4 (Queets River to the U.S./Canada border)

Under Action Alternative 3, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from May 1 through June 30, except on days that halibut fishing is open, and from August 1 through September 30; and prohibit retention of rockfish and lingcod seaward of a line approximating 10 fm during the month of July.

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Under Action Alternative 3, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 30 fm from the lingcod opening day through July 31.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

There is very little yelloweye and canary rockfish (0.03 mt and 0.02 mt, respectively, in 2005) caught in Marine Area 1; therefore, WDFW proposes to keep the status quo (No Action) bottomfish fishing regulations in place through 2007 and 2008.

2.2.3.4.7 Oregon Recreational Fisheries

Under Action Alternative 3a (there are two suboptions for the 2007-2008 Oregon recreational fishery under Action Alternative 3), the Oregon recreational groundfish fishery would be open all year, but restricted to depths shoreward of the 40 fm line from January 1 through May 31 and September 1 through December 31, and shoreward of the 25 fm line from June 1 through August 31. The marine fish daily bag limit would be reduced to 5 marine fish; however flatfish, including Pacific sanddabs, would be managed under a separate 25 fish daily bag limit for all flatfish species. Other changes to status quo (No Action) management measures under this alternative include a decrease in the lingcod minimum size limit to 22 inches and the expanded Stonewall Banks closure described under Action Alternative 1 would apply to the recreational Pacific halibut fishery, restricting targeting of Pacific halibut in this area. Additionally, retention of groundfish would be prohibited in this area, regardless of trip target. All other management measures under this alternative are the same as under the No Action Alternative.

Under Action Alternative 3b, the Oregon recreational groundfish fishery would be open all year shoreward of the 40 fm line. The marine fish daily bag limit would be reduced to 5 marine fish; however flatfish, including Pacific sanddabs, would be managed under a separate 25 fish daily bag limit for all flatfish species. Other changes to status quo (No Action) management measures under this alternative include a decrease in the lingcod minimum size limit to 22 inches and the expanded Stonewall Banks closure described under Action Alternative 1 would apply to the recreational Pacific halibut fishery, restricting targeting of Pacific halibut in this area. Additionally, retention of groundfish would be prohibited in this area, regardless of trip target. All other management measures under this alternative are the same as under the No Action Alternative.

2.2.3.4.8 California Recreational Fisheries

Under Action Alternative 3, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 3 include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- A two-fish bocaccio sublimit is included in the 10-fish RCG daily bag limit.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

California recreational groundfish management measures that differ from status quo under Action Alternative 3 include the following:

- Combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish, of which two can be a cabezon and two can be a greenling of the genus *Hexagrammos*.
- Lingcod daily bag limit of 3 fish, but with a minimum size limit of 22 inches.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 3 are described below and summarized in Table 2-23.

Table 2-23. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 3.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 40fm Closed							
North Central	---	---	---	---	---		> 40fm Closed					
South Central - Monterey	---	---	---	---	> 40fm Closed							
South Central - Morro Bay	---	---	---	> 40fm Closed							---	---
South Region*	---	---	> 60fm Closed									

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

Only half of month is open

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-February and 0-60 fm March-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 3 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through December shoreward of the 60 fm line and otherwise closed.
- California scorpionfish open year-round, but restricted to depths ≤40 fm in January and February, and ≤60 fm during March through December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open April through mid-October shoreward of the 40 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Pigeon Point under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through December shoreward of 40 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open mid-June through December shoreward of 40 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 40 fm and otherwise closed.

2.2.3.5 The Council-Preferred Action Alternative

This alternative will be decided at the June Council meeting in Foster City, CA.

2.2.3.5.1 Limited Entry Trawl Fisheries

2.2.3.5.2 Limited Entry Fixed Gear Fisheries

2.2.3.5.3 Open Access Fisheries

2.2.3.5.4 Nearshore Commercial Fisheries

2.2.3.5.5 Tribal Fisheries

2.2.3.5.6 Washington Recreational Fisheries

2.2.3.5.7 Oregon Recreational Fisheries

2.2.3.5.8 California Recreational Fisheries

2.2.3.6 Alternatives Considered, But Eliminated From Detailed Study

2.3 Comparison of the Environmental Consequences

To be completed after June 2006 when the Council will adopt a preferred alternative.

2.4 Social Net Benefit Analysis

To be completed after June 2006 when the Council will adopt a preferred alternative.

4.2 Criteria Used to Evaluate Impacts

A primary goal of the groundfish FMP is to rebuild to or maintain spawning stock biomass of groundfish stocks and stock complexes at B_{MSY}. Two critical considerations in evaluating alternative harvest levels relative to accomplishing this goal are the uncertainty of management measures to limit total fishing-related mortality to prescribed levels and the uncertainty in our understanding of stock status and productivity. In other words, the risks of allowing higher harvests to provide increased socioeconomic benefits (see Chapter 7 for an evaluation of socioeconomic impacts) need to be evaluated by the effectiveness of harvest monitoring systems to accurately determine total fishing-related mortality and assessment uncertainty. An additional consideration for depleted stocks is the tradeoff of duration of rebuilding vs. the amount of allowable harvest or total fishing-related mortality. All of these considerations are used to develop criteria for evaluating biological impacts to groundfish stocks.

Systems for monitoring groundfish mortalities (landings plus discard mortalities) on the West Coast vary in their effectiveness depending on whether the species is primarily caught in commercial or recreational fisheries and how well at-sea discards are monitored. In general, fishing-related mortalities of commercially caught species are better known than those for stocks primarily caught by recreational fisheries. This is because commercial landings are recorded on fish receiving tickets, which are used to document the weight and ex-vessel value of landed catch, while recreational catches are mostly monitored using a random, stratified census of anglers. The degree of at-sea monitoring of discards also varies by fishing sector with the limited entry at-sea whiting trawl sector having the highest at-sea observer rates; followed by limited entry bottom trawl (including shoreside whiting); limited entry fixed gear; open access; California commercial passenger fishing vessels (CPFV or California recreational charter); and California (non-CPFV), Oregon, and Washington recreational. The treaty tribes report that their fisheries are observed at a high rate because their fisheries are full retention fisheries for rockfish species.

Assessment uncertainty is another evaluation criterion for evaluating stock impacts. In general, assessments of species that are adequately sampled by a reliable source of fishery independent abundance information tend to be more robust with respect to estimating stock trends and abundance {NRC, 1998}. On the West Coast, groundfish surveys have typically been conducted using bottom trawl gear randomly stratified over latitudinal and depth strata along the continental shelf and slope {Lauth 2000, Weinberg et al. 2002}[2]. The results from these surveys are typically the key inputs to the stock assessments for West Coast groundfish stock assessments. For example, indices of abundance from the triennial trawl survey were used in 15 of the 22 assessments in Table 4-2, and 7 assessments used slope survey data. These surveys are also often the source of the biological data used to estimate life history parameters. For species that are not well sampled by traditional survey data, such as cowcod and yelloweye rockfish, other temporal indices of abundance are used to tune assessments. Many such indices, particularly fishery-dependent indices such as commercial or recreational catch per unit effort (CPUE) trends, tend to be associated with higher levels of uncertainty. Fishery-dependent data are often less reliable than fishery-independent data for a variety of reasons; for example, catch rates may be

2 The NMFS Alaska Fisheries Science Center originally implemented a full trawl survey completed every three years on the West Coast and hence called the "triennial" survey, data from this survey span from 1977 to 2004. The Alaska Center also conducted slope surveys beginning in 1984, although these surveys had varying temporal and spatial coverage. Since 1998, the NMFS Northwest Fisheries Science Center has conducted an annual bottom trawl survey of the West Coast slope, and since 2003 this survey has sampled both shelf and slope habitats. This survey (referred to as the "combined" survey) will be the key source of fishery independent information in the future. Currently, information from all of these surveys are typically used to tune West Coast groundfish stock assessments.

stable in the face of stock declines as a result of increasing fishing power or changing spatial patterns in effort {Hilborn and Walters 1992, Walters 2003}. Furthermore, management measures can substantially alter the integrity of fishery-dependent data, particularly in response to actions by managers to reduce or control effort. Consequently, assessments for data-poor species such as cowcod and yelloweye rockfish, which are based on highly uncertain catch reconstructions and recreational CPUE time series to inform biomass trends, are associated with much greater levels of uncertainty relative to other groundfish species' assessments.

As illustrated throughout section 4.1, model uncertainty is also a key factor in considering how the results of stock assessments are used. The perception of stock status and productivity for many stocks, particularly those for rebuilding species, often changes substantially between stock assessments. Such changes can be a result of a range of technical factors, including how a given assessment model is structured, the assumptions used to fix or estimate key parameters (i.e., whether parameters such as natural mortality and steepness are fixed, estimated freely, or estimated with an informative prior), and the evolution of methods for developing time series and estimates of uncertainty from different sources of raw data. As the population dynamics of target species themselves are responsive to a mix of complex (and typically poorly understood) biological, oceanographic and interspecific interactions, new sources of information (e.g., new data sets, extensions of existing data sets, incorporation of environmental factors into assessments) can also result in changes in parameter estimates and model outputs. Consequently, estimates of depletion levels and stock status can vary substantially between assessment cycles; as illustrated by the increase in the estimated OY of bocaccio from ≤20 mt to 250 mt between 2002 and 2003, and the perception from the most recent widow rockfish assessment that this stock may not have ever been below the overfished threshold of 25% of initial biomass. In such cases, the most plausible result from the assessment should still be viewed as highly uncertain and the risks associated with management decision-making should account for this uncertainty.

A logical conclusion for evaluating potential management decisions using highly uncertain assessment results is more precaution may be needed to avoid future problems if assumptions regarding stock status are overly optimistic. For example, Punt {2003} developed a simulation model to evaluate how well a particular set of management rules actually achieved management goals in the face of measurement error, process error, and model uncertainty. The study simulating the outcomes under a given set of rules for assessing progress, with regard to the number of times a rebuilding plan was revised, the average catch during the years that the resource was being rebuilt, and the ratio of the number of years that it took for a stock to rebuild over the number of years it was expected to take a stock to rebuild based on the original rebuilding plan. In general, results indicated that greater stability tended to be associated with smaller OYs (which were based on more conservative criteria for achieving success), and that frequent revisions to harvest rates that accompanied new assessments could lead to both a less stable management regime and longer overall rebuilding times.

The predicted times to rebuild the seven depleted species subject to FMP Amendment 16-4 relative to the amount of allowable harvest (to avoid significant or disastrous socioeconomic impacts to fishing communities) are determined in new rebuilding analyses recommended by the SSC in 2005 or, in the case of yelloweye rockfish, in 2006. These rebuilding analyses probabilistically evaluate allowable harvest vs. rebuilding duration relative to the maximum allowable time to rebuild (T_{MAX}) under the current National Standard Guidelines. T_{MAX} is defined as the minimum estimated time to rebuild with no allowable fishing-related mortality (T_{MIN}) plus one mean generation time. The soundness in defining T_{MAX} this way is that one mean generation, or the number of years predicted for a spawning female to replace herself in the population, is a relative biological index of stock productivity. Therefore, the range of allowable rebuilding periods is bounded by the biological limit of T_{MIN} or $T_{F=0}$[3], where all stock

3 T_{MIN} and $T_{F=0}$ are both predicted rebuilding periods in the absence of fishing-related mortality to the stock.

mortality is natural mortality and a scientifically-derived upper limit linked to stock productivity. Stocks exhibiting low productivity will necessarily have longer predicted rebuilding periods due to longer mean generation times. The probability of rebuilding by T_{MAX} (P_{MAX}) is therefore one of the criteria used to evaluate risk of alternative harvest levels for depleted species, since it is a metric that relates management risk (i.e., risk of not meeting the rebuilding target by T_{MAX}) to a stock's relative productivity.

However, given the guidance from the Ninth Circuit District Court not to follow a formulaic approach for deciding a stock's rebuilding plan, another criterion for evaluating alternative rebuilding plans is to use the extended duration of the predicted rebuilding period relative to $T_{F=0}$. This criterion may be more responsive to the court order to rebuild as quickly as possible (i.e., $T_{F=0}$) while considering the needs of fishing communities. The needs of fishing communities are considered by allowing some harvest of a depleted species as unavoidable bycatch while targeting healthy stocks. Any allowable harvest of a depleted species predicts a longer rebuilding period than $T_{F=0}$. How much longer rebuilding is extended from $T_{F=0}$ is therefore a sensible evaluation criterion.

4.3 Discussion of Direct and Indirect Impacts

This section evaluates and discusses direct and indirect impacts of OY alternatives and action alternatives (management measures) on affected species. A retrospective analysis of past management actions and resulting impacts is critical in this exercise to understand potential future impacts. To that end, final total catch estimates by fishing sector are provided for 2004 West Coast groundfish fisheries (Table 4-6) and "near-final" 2005 total catch estimates (Table 4-7). The reason 2005 catches are not considered final is that the full year of WCGOP observation data is not yet available and analyzed to reconcile at-sea discards; a process which has been completed for 2004 fisheries. In lieu of these data, projected impacts from the various sector bycatch models employed by the GMT to track discards relative to known landings is used. It is anticipated that final 2005 catch estimates will be available by the end of 2006, which is too late to be incorporated in the final EIS.

Impacts of OY alternatives are also compared between action alternatives and with the No Action Alternative and evaluated using the criteria described in section 4.2.

These terms are distinguished by when the F=0 strategy is considered. T_{MIN} is the predicted time to rebuild if all fishing-related mortality is eliminated from the onset of rebuilding (usually the year after the stock is declared overfished) and $T_{F=0}$ is the predicted duration of rebuilding if all fishing-related mortality to the stock is eliminated starting at the onset of the next available management cycle. $T_{F=0}$ is typically longer than T_{MIN} since some fishing-related mortality is typically allowed under a Council's rebuilding plan to avoid disastrous short term economic impacts from eliminating harvest. However, unless the stock has just been declared overfished, $T_{F=0}$ is the shortest possible time to rebuild the stock given our current understanding of the stock's productivity.

Table 4-5. Estimated total mortality (mt) of major West Coast groundfish species from commercial, tribal, and recreational fishing during 2003.

	LANDINGS AND MORTALITY			TARGETS	
Species	Estimated Total Catch	PRELIMINARY Estimated Commercial Fishery Discard Mortality b/	Actual Landings c/	Total Catch ABC	Total Catch OY
Lingcod	1,355.6	70.7	1,284.9	841	651
Pacific Cod	1,323.1	73.5	1,249.6	3,200	3,200
Pacific Whiting d/	142,913.8	1,422.7	141,491.1	188,000	148,200
Sablefish (north)	6,386.6	1,126.1	5,260.5	8,209	6,500
Sablefish (south)	204.0		204.0	441	294
Dover sole	8,342.2	956.6	7,385.7	8,510	7,440
English sole	1,241.4	339.0	902.4	3,100	
Petrale sole	2,160.6	144.4	2,016.2	2,762	
Arrowtooth flounder	3,243.5	904.8	2,338.7	5,800	
Other flatfish	2,093.5	490.7	1,602.8	7,700	
Pacific Ocean Perch	160.1	21.9	138.2	689	377
Shortbelly	9.3	2.3	7.0	13,900	13,900
Widow	57.9	16.1	41.8	3,871	832
Canary	48.5	14.2	34.3	272	44
Chilipepper	49.5	15.4	34.1	2,700	2,000
Bocaccio	29.1	8.5	20.6	198	20
Splitnose	118.8	9.3	109.5	615	461
Yellowtail	504.5	22.1	482.4	3,146	3,146
Shortspine Thornyheads e/	1,220.2	387.8	832.4	1,004	955
Longspine Thds. North e/	1,834.8	323.9	1,510.9	2,461	2,461
Longspine Thds. South	0.0			390	195
Cowcod, Monterey	0.4	0.2	0.1	19	2
Cowcod, Conception	0.0		0.0	5	2
Yelloweye	8.1	1.5	6.6	52	22
Darkblotched	139.9	51.8	88.1	205	172
Black Rockfish (north)				615	
Black Rockfish (south)				500	
Black Rockfish Total	1,150.1		1,150.1	1,115	

a/ Preliminary estimates of total catch mortality based on species discard assumptions used when the OYs were set. These assumptions are currently being revised using data from the West Coast Groundfish Observer Program.
b/ Preliminary estimated discard mortality in the commercial fishery. Preliminary trawl discard calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer data to 2002 trawl logbook data, by area and depth strata. Discard totals estimated for tows recorded in logbooks is expanded using state-specific ratios of fish ticket landings to retained logbook catch. Because tows conducted under Exempted Fishing Permits could not currently be completely removed from logbooks and fish tickets, applying fleetwide discard rates to these tows may overstate discard for some shelf species. In an effort to minimize this problem, rockfish discard from target tonnage caught within the RCA off Oregon was estimated using bycatch rates from that EFP. Since the Washington EFP included full retention of shelf rockfish, no at-sea discard of these species was estimated for tows occurring within the RCA off Washington, or on tows that exceeded the 2-month allowance of arrowtooth flounder outside the EFP. This column also includes at-sea discards of rebuilding species. Preliminary fixed-gear discard in the directed sablefish fisheries is calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer data to northern sablefish landings data. No logbooks are available for fixed-gear vessels. Because of limited geographic coverage of available data, fixed-gear discard amounts for species off central California are not well estimated at this time.
c/ Includes shoreside commercial and tribal landings from PacFIN, observed total catch including estimated discards in the at-sea whiting fishery, and RecFIN recreational catch plus observed discard mortality (A+B1).
d/ Discards of whiting are estimated from observer data and counted towards the OY inseason.
e/ Includes "unspecified thornyheads" allocated based on ratios estimated from California landings and At Sea north/south ABCs.

Table 4-6. Estimated total mortality (mt) of major West Coast groundfish species from commercial, tribal, and recreational fishing during 2004.

	2004 metric tons											Management reference points	
	Shore-side commercial fisheries				At-sea landings and discard	Shore-side WA tribal	State estimates of total recreational fishing mortality			Remaining GMT scorecard values [b]	Estimated total fishing mortality	Total catch OY	ABC
	Total landed catch	Estimated trawl discard	Estimated non-trawl discard [a]	Estimated total mortality			WA	OR	CA				
Target species													
Sablefish [c]		642	446										
mortality	5,079	321	89	5,489	29	712	0	5			6,235	7,510	8,185
Shortspine [d]	582	174		756	5	6	0	0			767	983	1,030
Longspine [c]	658	137		795	0		0	0			795	2,443	2,461
Dover	6,777	355		7,132	0	81	0	0			7,213	7,440	8,510
Petrale	1,961	76		2,037	0	82	0	0			2,119	2,762	2,762
English	956	193		1,149	0	80					1,229	na	3,100
Arrowtooth	2,328	3,255		5,583	3	82					5,668	na	5,800
Other Flatfish	1,371	497		1,868	2	19					1,889	na	7,700
Slope rockfish	1,073	634		1,707	24	23					1,754	na	na
Yellowtail rockfish [e]	576	80		655	48	352	24	12			1,091	4,320	4,320
Chilipepper [f]	43	102		145	2		0	0	6		153	2,000	2,700
Pacific hake	96,365	2,666		99,031	120,736	6,848					226,615	250,000	514,441
Rebuilding species (as of 2004)													
Lingcod		161.9											
mortality	178.8	80.9	4.5	264.2	1.4	25.0	64.2	107.2	130.0	27.1	619.1	735.0	1,385
Canary	15.9	8.5	3.5	27.9	5.2	3.0	1.7	3.9	9.0	7.3	58.0	47.3	256
Widow	72.9	4.8	0.1	77.8	21.1	21.0	0.0	0.7	15.0	40.6	176.2	284.0	3,460
Yelloweye	1.7	0.4	3.7	5.7	0.0	1.0	3.7	2.4	0.6	2.3	15.7	22.0	53
Bocaccio [f]	12.1	8.7	0.0	20.8	0.0		0.0	0.0	71.0	13.3	105.1	250.0	400
Cowcod [f]	0.0	0.8	0.0	0.9	0.0		0.0	0.0	1.0	0.5	2.4	4.8	24
POP [e]	120.6	23.4	0.0	144.1	1.0	3.0	0.0			7.6	155.7	444.0	980
Darkblotched	191.7	37.1	0.5	229.3	7.4		0.0			4.9	241.6	240.0	240

a/ Non-trawl discard includes estimates for the fixed gear nearshore and sablefish fisheries. Sablefish fishery estimates are based on observations of the primary limited entry, fixed gear season. Since few observations were made in this fishery south of Ft. Bragg, CA, discard estimates for southern species, such as bocaccio and cowcod, should not be viewed as complete.

b/ The Pacific Council's Groundfish Management Team produces a bycatch scorecard with the purpose to account for all sources of expected mortality for species that are managed under rebuilding plans. Remaining values are estimates of total mortality in EFPs and research catches.

c/ Area north of 36° N. Lat.

d/ Area north of 34°27' N. Lat.

e/ Area north of 40°10' N. Lat.

f/ Area south of 40°10' N. Lat.

Table 4-7. Estimated total mortality (mt) of major West Coast groundfish species from commercial, tribal, and recreational fishing during 2005.

Species	Landings	Discard Estimate	Tribal	At-Sea	Recreational	Remaining GMT Scorecard Values	Estimated total fishing mortality	Total catch OY	ABC
Arrowtooth Flounder	2,082	2,854	161	1			5,098		5,800
Dover sole	6,767	707	145				7,619	7,476	8,522
English Sole	856	279	66				1,201	3,100	3,100
Petrale	2,714	155	30				2,899	2,762	2,762
Remaining Flatfish	1,172	306	48	3	37		1,566	4,090	6,781
Shortspine (V&C&E&M)	486	194	11	7			698	999	1,055
Longspine (V&C&E&M)	588	95					683	2,461	2,461
Sablefish Coastwide							6,713		8,368
Sablefish N CP	5,351	485	700	15			6,551	7,486	
Sablefish Conception	144	18					162	275	
Longspine (CP)	60	10					70	195	390
Shortspine (CP)	151	68					219		
Pacific Cod	729		124				853	1,600	3,200
Chilipepper (MT&CP)	36				4		40	2,000	2,700
Yellowtail (V&C&E)	208		581	73	30		892	3,896	3,896
Spiny Dogfish	463		291	70			824		
Slope rockfish Nor	160	45	29	51			285	1,160	
Slope rockfish So	166	18					184	639	
Splitnose RF (MT&CP)	87						87	461	615
Black Rockfish Nor 46 16					271		271	540	540
Black Rockfish So 46 16	173				514		687	753	753
CA Scorpionfish So	5						5		
Cabezon	60						60		
Cabezon S 42	31				48		79	69	103
Cabezon N 42	29				25		54		
Kelp Greenling	22						22		
Kelp Greenling Nor 42	21				6		27		
Kelp Greenling So 42	1				5		6		
Lingcod	173	123	31	2		6	821		2,522
Lingcod N 42	110	78	31	2	204		426	1,801	
Lingcod S 42	63	45			282		390	612	
Canary rockfish	8	5	5	1	12	9	40	47	270
Darkblotched RCKFSH	87	46		11		4	148	269	269
POP (V&C&E)	58	11	4	2		4	79	447	966
Bocaccio	8	52			44	2	106	307	566
Widow Rockfish	81	1	30	79	4	1	196	285	3,218
Yelloweye (V&C&E&M)	1		1		12	7	22	26	54
Cowcod						2			
Cowcod CP								2	5
Cowcod N CP								2	19
Pacific Whiting	96,859	41	35,349	127,421			259,670		269,545

4.3.1 *Depleted Groundfish Species*

4.3.1.1 Impacts of Optimum Yield Alternatives

Each OY alternative analyzed for depleted groundfish is evaluated using the criteria discussed above in section 4.2. In summation, these evaluation criteria are relative catch monitoring uncertainty, relative assessment uncertainty, the estimated rebuilding probability, and the extended duration of rebuilding. The tradeoff of available harvest under alternative OYs for depleted species and predicted rebuilding times for these species (i.e., the extended duration of rebuilding) is also described in section 2.1.1.1 and depicted in Table 2-3 and Figure 2-2.

This section also describes the types of strategies that should be considered in a groundfish species' rebuilding plan. As OYs decrease across the range of alternatives, more precautionary management measures and risk-averse strategies need to be employed to reduce total fishing-related mortality to prescribed levels.

General Rebuilding Strategies

Harvest Limits (Harvest Guidelines or Quotas)

The Council sets OYs for each depleted stock (among other managed species). Although resulting OYs are considered harvest guidelines, the Council has treated them as hard limits on total fishing mortality for overfished species. For example, they have closed fisheries late in the year if a depleted species' OY is projected to be exceeded. In some cases, OYs for co-occurring healthy groundfish stocks are reduced to limit the incidental mortality of one or more depleted groundfish species.

Permits, Licenses, and Endorsements

Participation in the Washington, Oregon, and California commercial groundfish fishery was partially limited beginning in 1994 when the federal vessel license limitation program was implemented (Amendment 6). Subsequently, Amendment 9 further limited participation in the fixed-gear sablefish fishery by establishing a sablefish endorsement. There is currently no federal permit requirement for other commercial participants (fishers or processors) or recreational participants (private recreational or charter). A buyback of vessels in the limited entry trawl fishery, and associated permits, was completed in 2003. This reduced participation in this sector by roughly one-third.

Trip Landing and Frequency Limits

Cumulative trip limits have been a key fixture of groundfish management for many years. Currently, these limits set for stocks, stock complexes, and species groups dictate the total amount of fish that may be landed during a one- or two-month period. Separate limits are established for the limited entry trawl, limited entry fixed gear, and open access sectors. Landing limits on target species may be adjusted in order to limit coincident catch of depleted species. A limited entry trawl trip limit of 100 pounds per month was established in 2004 for large footrope gear, which may only be used seaward of the Rockfish Conservation Area (RCA).

Seasons

Specification of different seasonal fishing opportunities by region is a management tool increasingly used to limit fishing mortality in West Coast recreational groundfish fisheries. Seasons can be adjusted inseason and often vary by the depths open to fishing to fine tune the balance between fishing opportunities and conservation of depleted species.

Area Closures

Beginning in 2002, RCAs came into use as a way of decreasing bycatch of depleted species. The sector-specific RCAs encompass the depth ranges where bycatch of depleted species is most likely to occur, based on information retrieved from log books, the at-sea observer program, catch records, and trawl survey data; and fishing by designated groundfish fishery sectors is prohibited within its boundaries. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch. Additionally, there are discrete RCAs designed to protect certain species such as cowcod and yelloweye rockfish (two Cowcod Conservation Areas exist south of 34°27' N latitude and one Yelloweye RCA exists in waters off northern Washington). These "species-specific" RCAs also provide a measure of protection for other co-occurring depleted groundfish species.

Gear Restrictions in Trawl Fisheries

Definitions of legal gear types and restrictions on mesh size in trawl gear have been part of the FMP since its inception. A cod end 4.5 inch minimum mesh size has been specified for groundfish trawl gear for many years to reduce the bycatch mortality of juvenile groundfish species and fish that are too small to be marketable. Since 2000, restrictions have been put on the use of trawl nets equipped with large footropes. By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. In areas shoreward of the RCA large footrope gear is prohibited, preventing trawlers from accessing rocky habitat in these shallower depths. In areas seaward of the RCA, either small or large footrope gear may be used, although large footrope gear is the preferred gear type in these depths since small footropes tend to dig into the softer sediments of the slope and abyssal plain. In addition, cumulative trip limits have been structured in recent years to encourage vessels to fish exclusively in deep water where some overfished species are less likely to be encountered. Trawl vessels were allowed to use all these legal gear configurations during any given cumulative limit period. However, in 2004 trawl vessels which used the small footrope configuration were restricted to lower cumulative trip limits for target species in comparison to vessels using large footrope configurations. These measures encouraged fishing exclusively in deeper water to take advantage of the higher limits afforded this gear type. In 2005 and 2006, trawl vessels were not restricted with respect to gear-specific cumulative landing limits in any one period, but they were restricted to the area they could fish, either shoreward or seaward of the RCA, in any one period. Large or small footrope trawls were allowed seaward of the RCA, while only small footrope trawls were allowed shoreward of the RCA south of 40°10' N latitude and selective flatfish trawls allowed shoreward of the RCA north of 40°10' N latitude (selective flatfish trawls were also allowed to be used south of 40°10' N latitude, but were not mandated shoreward of the RCA as they were in the north). The selective flatfish trawl net is configured with a cut back headrope, low rise, and a small footrope, a design shown to substantially reduce catches of some rockfish species while more efficiently catching target flatfish species. This is because most rockfish species rise to escape an approaching trawl net, while flatfish species tend to dive. The rockfish escape due to the low rise and cut back headrope. While this gear has been tested and mandated shoreward of the RCA since 2005 in waters north of 40°10' N latitude, it has not been fully tested in waters south of 40°10' N latitude. Therefore, the behavior and bycatch rates of southern rockfish species, such as bocaccio, when encountering a selective flatfish trawl are unknown at this time. However, this gear may also be effective at reducing bycatch of southern rockfish species in the bottom trawl fishery and should be explored further.

Bycatch reduction devices (BRDs), also known as fish excluders, are mandated for the exempt trawl fishery targeting pink shrimp. Pink shrimp trawls historically had a high bycatch of rockfish. ODFW researched various BRD configurations to determine those devices that significantly reduced rockfish bycatch without an overall reduction in pink shrimp catch efficiency. Now specific hard grate BRDs and other accepted configurations are mandated for West Coast pink shrimp trawls and resulting rockfish bycatch has been reduced dramatically.

Gear Restrictions in Fixed Gear Fisheries

Limited entry and open access fixed gear fisheries on the West Coast use hook and line gears, longlines (both vertically and horizontally deployed on the bottom or suspended off the bottom), and pots/traps to target groundfish. Rockfish bycatch has been shown through WCGOP observations to be much lower in pots and traps targeting groundfish than line gears. While a substantial portion of the fixed gear fleets use pots and traps, a significant amount of line gear is used to target nearshore groundfish species and sablefish. Five of the seven rockfish species currently managed under rebuilding plans are shelf species vulnerable to capture using line gears. The two depleted slope species, darkblotched rockfish and POP, are rarely caught using fixed gears. Therefore, measures that would reduce the use of line gears in West Coast shelf areas, where these depleted rockfish species occur, should be considered when developing long term rebuilding strategies. Alternatively, how line gears are fished should be explored more thoroughly since some line gear configurations and fishing strategies may also reduce the bycatch of depleted groundfish species.

Size and Bag Limits

Minimum size limits are specified for many depleted groundfish species to protect recruiting and premature fish from targeted harvest.

Bag limits are a daily limit of species allowed to be retained by anglers. These measures are used for recreational fisheries to limit mortality of depleted groundfish species. In some cases, no retention is allowed for depleted groundfish species as a means to eliminate any potential targeting that might otherwise occur.

Fishery Monitoring and Bycatch Estimation

All commercial groundfish landings are monitored through a fish ticket system requiring reporting by buyers and processors. Bycatch has become a crucial component of total fishing mortality for depleted species. In the last five years, harvest limits or OYs have evolved from an allowed landing limit to a total mortality limit where at-sea dead discards are also counted against the OY. NMFS implemented the West Coast Groundfish Observer Program (WCGOP) in August 2001, and these data were first used to estimate total fishing mortality beginning in mid-2003. The limited entry trawl sector was the first commercial sector to be managed using WCGOP data to estimate discards. In 2004 bycatch modeling was expanded to the primary sablefish fishery prosecuted by limited entry fixed gear vessels as WCGOP data became available for that sector. In 2005 WCGOP data was used to model bycatch of groundfish species in nearshore commercial fisheries in California and Oregon. As more observer data from different fishery sectors become available, further model extensions will be developed to more accurately estimate bycatch of depleted species in these sectors.

Recreational fishery monitoring and bycatch estimation is a state responsibility and each West Coast state employs a different system. Washington and Oregon employ a random, stratified census of anglers to estimate catch and effort with relative precision. In California, where the coastline is much longer, recreational participation much greater, and the larger number of ports, recreational monitoring and catch estimation was done through a federal census known as Marine Recreational Fisheries Statistical Survey (MRFSS). The MRFSS survey, designed to look only at national trends of marine angler participation, is not precise enough to manage the low harvest guidelines used in recreational fishery management to help rebuild depleted stocks. Therefore, in recent years, efforts have been made to improve recreational fishery sampling in California. For instance, in 2001 the Pacific States Marine Fisheries Commission (PSMFC), with support from NMFS, began a new survey to estimate party/charter boat (commercial passenger fishing vessel [CPFV]) fishing effort in California. This survey differed from the traditional MRFSS telephone survey of anglers to determine CPFV trips by two-month period. The survey sampled 10% of the active CPFV fleet each week to determine the number of trips taken and the anglers carried on each trip. This 10% sample was then expanded to make estimates of total angler trips for Southern California and Northern California. However, the requisite precision for managing the low OYs of overfished species like canary rockfish and bocaccio was still lacking. Fishery scientists from the CDFG and the PSMFC designed a new program for sampling California's recreational fisheries, incorporating both the comprehensive coverage of the MRFSS program and the high quality sampling of CDFG's Ocean Salmon Project. The goal of this new program, the California Recreational Fisheries Survey (CRFS), was to produce in a timely manner marine recreational, fishery-based data needed to sustainably manage California's marine recreational fishery resources. The CRFS program, implemented in January 2004, increased the timeliness and accuracy of recreational fisheries data to more effectively monitor catches inseason, estimate take of species of concern, develop harvest guidelines, produce higher quality fishery-dependent indices for stock assessments, and provide other information critical to management decisions.

Bocaccio (in Waters off California South of 40°10' N Latitude)

Specific Bocaccio Rebuilding Strategies

Bocaccio OYs, compliant with the adopted rebuilding plan, have been specified for managing this stock. In most years (with the exception of a slight overage in 2003 when the OY was ≤20 mt, or about 6.5% of the 2006 OY), bocaccio total mortality has been well below the specified OY (Tables 4-5, 4-6 and 4-7). The Council and NMFS have also adopted the practice of reducing the chilipepper rockfish OY from the ABC, despite the healthy abundance of this stock, as a precautionary measure to reduce the incidental mortality of co-occurring bocaccio. Reducing the chilipepper rockfish OY for the purpose of reducing bocaccio mortality may be less necessary given the advent of managing fisheries using depth-based RCAs.

Commercial bocaccio fishery impacts are managed using a combination of area closures (discussed below) and variable cumulative landing or trip limits. A limited entry trawl trip limit of 100 pounds of bocaccio per month was established in 2004 for large footrope gear to accommodate unavoidable bycatch, which may only be used seaward of the RCA. Limited entry fixed gear and open access limits vary by two-month period and north and south of Point Conception within a range of being closed in some periods to 300 pounds per two-month period. Under the No Action Alternative, trip limits for co-occurring southern shelf rockfish species, including chilipepper rockfish, have been adjusted to limit the incidental harvest of bocaccio.

Recreational bocaccio impacts are managed using a combination of area closures (discussed below), minimum size and daily bag limits (discussed below), and seasons. California manages its recreational fisheries according to five sub-areas (referred to as Rockfish/Lingcod Management Areas) defined by latitudinal boundaries. Different closed seasons have been applied, and modified inseason, primarily to limit canary rockfish catches, the most constraining of the overfished species; but these actions also serve to limit recreational catches of bocaccio.

Area closures or RCAs are one of the more effective rebuilding strategies for reducing bocaccio mortalities. South of 40°10' N latitude, the seaward boundary of the RCA or the limited entry trawl sector is 150 fm in 2006, and the shoreward boundary varies between 75 fm and 100 fm, depending on period. Around offshore islands south of 34°27' N latitude the inner boundary extends to the shoreline. The seaward boundary is the same for limited entry fixed gear and open access sectors; the shoreward boundary either 20 fm, 30 fm, or 60 fm, depending on area and period. California has implemented, and modified inseason, closed areas in their recreational management, restricting fisheries to areas shoreward of boundaries at 20 fm, 30 fm, or 60 fm, depending on sub-area and month. Additionally, the existing Cowcod Conservation Areas south of 34°27' N latitude, where sport and commercial bottom fishing is prohibited, provide significant protection for bocaccio. Any additional RCAs south of 40°10' N latitude in the 15-180 fm zone will provide some additional protection of bocaccio. The greatest density of bocaccio occurs south of 34°27' N latitude in the 54-82 fm zone; therefore, any new RCAs in the Southern California Bight in these depths should provide the most conservation benefit. However, bocaccio are less sedentary than rockfish species such as cowcod and yelloweye. Smaller, discrete RCAs may therefore provide incrementally less conservation benefit for bocaccio relative to more sedentary species.

Minimum size and daily bag limits are used to restrict targeting of juvenile bocaccio and total take of bocaccio, respectively. A 10-inch minimum size limit is applicable to bocaccio in waters off California. Under the No Action Alternative, California has implemented a 10-fish bag limit for the rockfish-cabezon-greenling stock complex. Within the 10-fish bag limit there are bocaccio sub-limits of two fish north of 40°10' N latitude and one fish south of 40°10' N latitude.

Evaluation of Optimum Yield Alternatives

Bocaccio rebuilding schedules across the analyzed OY alternatives range from 0-11 years relative to the shortest predicted time to rebuild the stock of 2021 (i.e., 2021-2032) (Table 4-8). Rebuilding probabilities range from 50% for the highest OY alternative of 424 mt, which is the legal upper limit of possible OYs that can be considered, to 95.8% for the zero-harvest alternative. A significant amount of the total mortality of bocaccio now occurs in the California recreational fishery, the sector with the largest bocaccio take in recent years (Tables 4-5, 4-6 and 4-7), which leads to a high catch monitoring uncertainty. While California recreational catch time series are important fishery-dependent indices in the bocaccio stock assessment, the MacCall {2006} assessment is considered relatively certain given generally good data quality and consistency.

The range of preferred OYs specified by the Council in April 2006 of 40-218 mt compares to the status quo 2006 OY of 309 mt. Rebuilding is extended by less than a year from the shortest possible time ($T_{F=0}$) under the harvest rate used to determine the 40 mt alternative to 5 years under the preferred High OY alternative of 218 mt, which is 3 years shorter than under the status quo harvest rate. The range of rebuilding probabilities (P_{MAX}, or the probability of successful rebuilding in the maximum allowable time under National Standard 1 guidelines) for these preferred OYs are 77.7% to 94.3%. Last year, the SSC recommended a general rebuilding policy of establishing harvest rates that lead to rebuilding probabilities of about 80%[4]. The preferred OY range for bocaccio approximates this P_{MAX} "target".

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4 This recommendation came under the consideration of rebuilding revision rules the Council and its advisors crafted in 2005. The Ninth Circuit Court of Appeals ruling on the challenge to the darkblotched rebuilding plan may have obviated the need for these revision rules by imposing a standard of specifying the shortest possible rebuilding periods while considering the needs of fishing communities. However, as described in section 4.2, P_{MAX} is still a reasonable criterion for evaluating future risks of overharvest given a stock's relative productivity.

Table 4-8. Evaluation of alternative 2007-2008 bocaccio OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)						
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**Pref. Low OY Alt.**	**OY Alt. 2**	**OY Alt. 3 (Pref. High OY)**	**OY Alt. 4**	**OY Alt. 5**
	309	0	**40**	149	**218**	315	424
Catch monitoring uncertainty	High uncertainty due to a significant recreational catch component using MRFSS data (prior to 2004). [a/]						
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.						
Rebuilding Probability (P_{MAX})	68.4%	95.8%	94.3%	84.4%	77.7%	67.8%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	8	0	0.8	3	5	8	11

a/ Catch monitoring uncertainty has improved with the implementation of the California Recreational Fisheries Survey (CRFS) in 2004. However, until CRFS is fully evaluated and catch estimates are provided in a more timely fashion, catch monitoring uncertainty is still regarded as relatively high.

The recent history of bocaccio assessments is one marked with volatile swings in our understanding of stock status and productivity driven largely by infrequent recruitment events. MacCall {2002} characterized the stock as severely depleted and unlikely to rebuild within T_{MAX} under a zero-harvest strategy. However, evidence of a significant recruitment of the 1999 year class was validated in the bocaccio assessment conducted the following year {MacCall 2003}. The emerging understanding is stock productivity may better be characterized as one driven by rare large recruitments. Minimizing the mortality of these large year classes promises to rebuild the stock fastest. In the current regime of depth-based management, the stock is most vulnerable in the juvenile phase when they occur in shallow waters and are incidentally caught in nearshore commercial and recreational fisheries. However, as bocaccio mature, they migrate to deeper waters where the current RCA restricts those fisheries which are most likely to take adult bocaccio and other co-occurring depleted rockfish. There is some indication that bocaccio recruitment typically occurs from Santa Barbara to Santa Cruz, and is rare south of Ventura, with no evidence of separate southern California recruitment events {MacCall 2003}. Therefore, if this recruitment pattern persists in the future, large recruitment events may be indicated by large incidental catches in central California nearshore fisheries. As recent management experience also indicates, avoiding juvenile bocaccio in these waters during such times is difficult.

Given this recruitment dynamic, what harvest rate provides the best balance of conservation needs without overly restricting California commercial and recreational fisheries? The new bocaccio assessment {MacCall 2006} shows exploitation rates have favored rebuilding since 1998. Those OYs fall within the preferred 2007-2008 OY range of 40-218 mt; however, only in 2003, when fisheries were severely restricted due to the pessimistic 2002 assessment result, was the annual total mortality of bocaccio ≤40 mt. The Preferred Low OY may still be difficult to manage with the same restrictive management measures used in 2003 in the event of another large recruitment. Clearly, a significant negative economic impact would be felt in California fishing communities under the Preferred Low OY harvest rate for a rebuilding "cost" of about four additional years of rebuilding under the Preferred High OY harvest rate. Even under the Preferred High OY of 218 mt, management measures would have to be restrictive, especially for nearshore commercial and recreational fisheries in central California, to stay within that harvest rate during years of large recruitments.

Evaluation of Action Alternatives

All the action alternatives contemplate a liberalization of the Cowcod Conservation Areas in the Southern California Bight. The CCAs currently protect more than just cowcod. An ongoing analysis of larval abundance data suggest that the current western CCA is a region of high abundance of bocaccio (S. Ralston, unpublished data), with the recent density particularly high relative to the long term (historical) distribution of bocaccio. Although the CCA was not implemented to protect bocaccio, the potential to increase catches of other rebuilding species that could result from modifications to CCA boundaries is presumably non-trivial.

Action Alternative 1 is the only action alternative estimated to stay within the Preferred Low OY Alternative for bocaccio. Most of the southern nearshore and shelf groundfish fisheries are constrained by the Preferred bocaccio Low OY, but especially those fisheries south of Pt. Conception. Action Alternatives 2 and 3 stay within the Preferred High OY Alternative for bocaccio.

As recent experience has shown, a strong year class will initially be caught in nearshore fisheries and hard to avoid. Higher OYs or a rebuilding framework that allows one-year overages if the long term harvest rate is not exceeded should be considered for this stock due to its episodic recruitment pattern.

Canary Rockfish

Specific Canary Rockfish Rebuilding Strategies

All of the rebuilding strategies used to reduce mortality of depleted species on the West Coast are used to help rebuild canary rockfish. Management of this stock tends to constrain more West Coast fisheries than any other groundfish stock since canary rockfish are distributed coastwide, are found in a variety of habitats, and are caught by a variety of different fishing gears. Canary rockfish are distributed from nearshore areas as juveniles out to about 150 fm as adults and are found at times suspended off the bottom or in atypical soft-bottom habitats for rockfish.

Management of canary rockfish under the harvest rates specified in the current rebuilding plan has been difficult and OYs have been exceeded in two of the last three years. The canary rockfish OY was exceeded by 4.5 mt in 2003, 11 mt in 2004, but, in 2005, total estimated mortality was less than the OY by about 7 mt. Tailoring the management regime to stay within the low harvest rates specified for canary and other depleted rockfish has been an evolutionary process of adaptive management. Better impact modeling with an increasing sample of depth-based discard rates from the WCGOP, gear restrictions (described below), capacity reduction of the limited entry trawl fleet, educational outreach to anglers to avoid canary and other depleted rockfish, restrictive limits and non-retention regulations, and, most importantly, depth-based RCA management have all contributed to improved performance of the management regime in managing canary rockfish.

Canary rockfish are not allowed to be retained in commercial and recreational hook and line or fixed gear fisheries and a small, incidental landing limit is allowed in the limited entry trawl fishery to account for unavoidable incidental bycatch. However, mandating the use of the selective flatfish trawl shoreward of the RCA north of 40°10' N latitude has helped reduce trawl bycatch. Attempts to test selective flatfish trawls south of 40°10' N latitude through implementation of Exempted Fishing Permits have not been successful due to lack of participation. Nevertheless, while these trawls are legal small footrope gear in the south and are volitionally used, experience with these trawls in the north compels consideration of mandating their use shoreward of the RCA south of 40°10' N latitude. At-sea monitoring of their efficacy in southern fisheries through the WCGOP may eventually validate their use in the south. Midwater trawls also catch canary rockfish. The directed midwater trawl fishery for yellowtail rockfish was discontinued in 2002 due to high bycatch of canary and widow rockfish. The midwater trawl fishery for whiting, which is not currently restricted in the trawl RCA, also catches canary rockfish. Implementation of a canary rockfish bycatch cap, where, if attained, the non-tribal fishery would close inseason even if whiting quotas have not been attained, has successfully reduced canary rockfish mortality. This strategy works for the whiting fishery because of near real-time bycatch reporting and open communication to the rest of the fleet when bycatch of canary occurs in any one area.

Use of broad based RCA configurations has had the most effect in reducing canary rockfish mortality and the concept of depth-based RCA management was largely compelled by this need. Figure 4-2 shows the catch per tow of canary rockfish in the NMFS bottom trawl survey, which can be used as an index of the stock's depth and latitudinal distribution. While there are some instances of canary rockfish occurring south of Pt. Conception at 34°27' N latitude, they are largely distributed north of Conception with the greatest density in northern waters off Washington. They are most often found in depths from 50-100 fm, but as can be seen in Figure 4-2 and from Table 4-1, they can occur in the 27-150 fm depth range. The core depth range of the trawl RCA is 100-150 fm, with both shoreward and seaward extensions of the RCA boundaries depending on seasonal conservation needs (canary rockfish and other depleted species tend to make seasonal shoreward-seaward migrations with more shallow distributions in the summer months). Most of the incidental trawl take of canary rockfish occurs shoreward of the RCA since the seaward boundary is often extended out to 200 fm to reduce mortality of darkblotched and POP. The non-trawl RCA extends out to 100 fm north of Cape Mendocino and 150 fm south. Most of the incidental non-trawl take of canary rockfish occurs seaward of the RCA in the north. More discrete area closures, such as those used to reduce mortality of cowcod and yelloweye rockfish, may also help reduce canary mortality, but will likely prove to be less effective for canary rockfish due to their mobility and apparent lack of site fidelity.

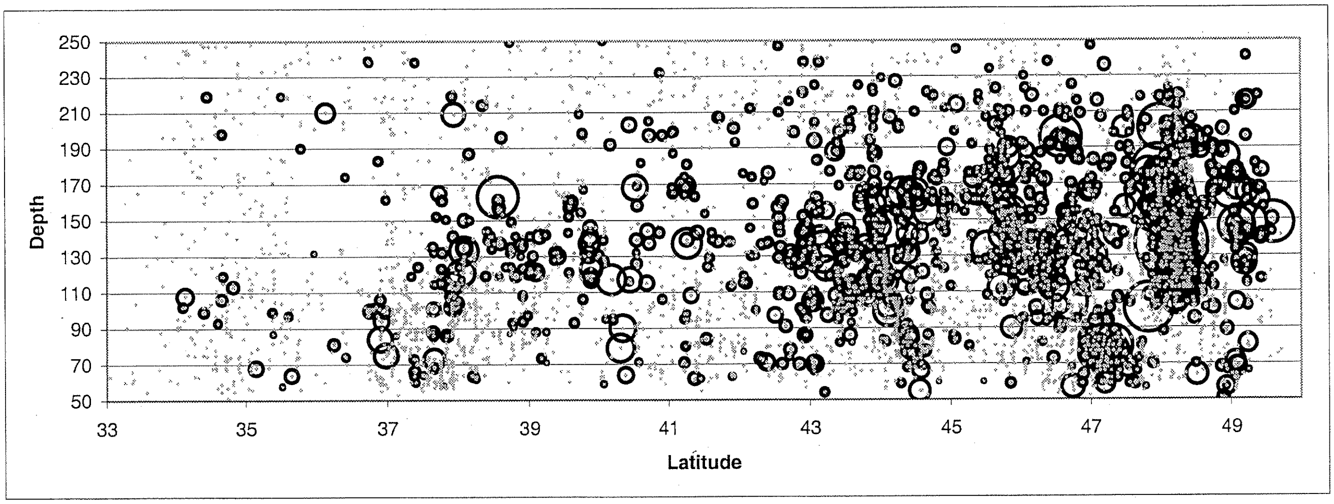

Figure 4-2. Catch per tow of canary rockfish in the bottom trawl survey. Dots are tows with zero catch. Circle size is proportional to the square root of catch per tow. Depth is in meters. Figure from the 2005 canary rockfish assessment (Methot and Stewart 2006)

Evaluation of Optimum Yield Alternatives

Table 4-9 shows the results of the evaluation of alternative canary rockfish OYs analyzed for 2007-2008 using the criteria described in section 4.2.

The canary rockfish OYs considered for 2007-2008 are based on a relatively certain stock assessment, despite the fact that recent recruitments are unknown due to a lack of recent fishery-dependent information (since the fishery has been structured to avoid canary) and the most recent years of the NMFS Northwest Fishery Science Center combined shelf/slope bottom trawl survey were not used. The second, "mop-up" STAR Panel, which reviewed the assessment in September 2005, also recognized the bottom trawl surveys may not provide an adequate index of abundance for shelf rockfish. For canary rockfish, the particular concern is that the level of stock depletion in trawlable habitat may not be reflective of overall population status. However, the historical data inputs to the assessment are more certain than for many of the other West Coast stocks and the 2005 assessment received a particularly high level of scientific scrutiny.

The relative certainty of the assessment result is tempered by a relatively uncertain total catch monitoring component, particularly since there is a significant portion of the total annual catch taken in recreational fisheries. Precautionary management of recreational fisheries to stay within the low canary OYs analyzed in this EIS will still be a predominant theme in rebuilding this stock and managing West Coast fisheries in the coming years. Uncertain total catch estimates will also lead to increasing assessment uncertainty as total removals become less certain and fishery-dependent trends used as assessment indicators of recruitment and biomass are less reliable.

Rebuilding probabilities (P_{MAX}) for alternative canary rockfish OYs are all low ranging from 66% for the zero-harvest alternative to 50% for the highest OY considered. The harvest rates for the Preferred Low and High OYs have a 55% and 58% probability of rebuilding by T_{MAX}, respectively, while the No Action OY predicts about a 55% probability of successful rebuilding by T_{MAX}. Such low rebuilding probabilities infer increased risk in canary stock rebuilding, a condition which recommends a precautionary management approach.

The estimated median time to rebuild the canary rockfish stock under the zero-harvest alternative is 2053. An additional 7 years of rebuilding is predicted under the harvest rate used to determine the Preferred Low OY of 24 mt and 10 years under the Preferred High OY of 44 mt. This compares to slightly more than 11 years under the status quo OY and an additional 18 years under the highest OY of 68 mt. Given that canary rockfish is the most constraining stock in the West Coast groundfish fishery, this tradeoff in canary OY vs. rebuilding duration will be one of the more important considerations for the Council and NMFS.

Table 4-9. Evaluation of alternative 2007-2008 canary rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)					
	No Action OY Alt. (2006 OY)	OY Alt. 1	OY Alt. 2	Pref. Low OY Alt.	OY Alt. 3 (Pref. High OY)	OY Alt. 4
	47	0	24	**32**	**44**	68
Catch monitoring uncertainty	High uncertainty due to a significant recreational catch component.					
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.					
Rebuilding Probability (P_{MAX})	54.8%	66%	60%	58.3%	55.4%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	11.4	0	5	7	10	18

Evaluation of Action Alternatives

Action Alternative 1 is the only action alternative estimated to stay within the Preferred Low OY Alternative for canary rockfish. Most of the current northern fisheries primarily constrained by canary rockfish OYs, such as recreational groundfish fisheries, are predicted to be more constrained by the Preferred Low OY for yelloweye under Action Alternative 1 (Table 2-14). Likewise, the Preferred Low OY for bocaccio tends to constrain southern fisheries historically constrained by canary rockfish more than the Preferred Low OY for canary rockfish. Action Alternatives 2 and 3 stay within the Preferred High OY Alternative for canary rockfish. While yelloweye rockfish OYs will be increasingly more constraining under the Preferred High OY ramp-down strategy, canary rockfish OYs will continue to be the most constraining to fisheries, especially in the four-year yelloweye harvest rate ramp-down transition period under that alternative.

Cowcod

Specific Cowcod Rebuilding Strategies

The prevailing management strategy for rebuilding cowcod is complete avoidance and allowing fisheries with only a "de minimus" fishing-related mortality. Historically, cowcod, due to their large size and superior flesh quality, were targeted in commercial and recreational fisheries. Non-retention regulations have been implemented for all West Coast fisheries to eliminate any possible targeting. Most importantly, all the critical cowcod habitat known through area-specific fishery information and other site-specific survey data have been closed to any type of bottom fishing that might take cowcod. These critical habitats are encompassed in two areas in the Southern California Bight south of Point Conception called the Cowcod Conservation Areas (CCAs, Figure 2-3). Area management is a particularly effective strategy for protecting cowcod given their sedentary life style and site fidelity. Piner et al. {2006} determined these management measures have been effective in keeping total mortality well under the low OYs used to manage this stock since the implementation of the CCAs and no retention regulations in 2001.

Evaluation of Optimum Yield Alternatives

It is particularly difficult to evaluate the cowcod OY alternatives given the great uncertainty in actual total catch and stock status. Both of these factors compel a very precautionary approach in rebuilding this very unproductive stock. OY alternatives 3-5 may be risky given this high uncertainty and the longer rebuilding periods (17-39 years beyond $T_{F=0}$) predicted by those harvest rates. The preferred OY range of 4-8 mt in the Conception and Monterey areas have much shorter predicted rebuilding periods, extending the duration of rebuilding 4-8 years beyond the time predicted under a zero-harvest strategy. The estimated rebuilding probabilities under the preferred Low and High OYs are also reasonably high ($P_{MAX} \geq 80\%$), which helps mitigate the risk of managing stock rebuilding with such high uncertainty.

Table 4-10. Evaluation of alternative 2007-2008 cowcod OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)						
	No Action OY Alt. (2006 OY)	OY Alt. 1	Pref. Low OY Alt.	OY Alt. 2 (Pref. High OY)	OY Alt. 3	OY Alt. 4	OY Alt. 5
	4.2	0	**4**	**8**	14	18	22
Catch monitoring uncertainty	Very high uncertainty due to a paucity of at-sea observations.						
Assessment Uncertainty	Very high uncertainty due to poor data quality.						
Rebuilding Probability (P_{MAX})	90.2%	100%	90.6%	80%	70%	60%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	4.1	0	4	8	17	27	39

Evaluation of Action Alternatives

All the action alternatives contemplate a liberalization of the Cowcod Conservation Areas in the Southern California Bight. The most significant risk of altering the perimeters of the CCA is the possibility that incidental catches of cowcod would increase, either as a result of incidental catches at the boundary of the fathom lines, or from incidental catches resulting from inadvertent incursions of vessels into shallower depth in the boundary lines. Such risks are associated with all of the potential alterations to both the outer and inner perimeters. Although this risk is difficult to evaluate, the steep and complex topography of the continental shelf and slope in these regions, and the corresponding complexity of the perimeter line alternatives that would be developed to exclude fishing from those depths in which cowcod are most abundant, suggests that there is significant potential for such incursions.

It is worth noting that while most cowcod are found within the 40 to 150 fm depth range, commercial catch and resource survey data demonstrate that cowcod can be found as shallow as 20 fm, in low-moderate numbers to 220 fm, and infrequently to at least 270 fm {Butler et al. 1999; Love et al. 2002; unpublished survey data}. Consequently, even with precise adherence by commercial fishermen to the outer perimeter of 175 fm under action alternatives 1 and 2, and similar performance by recreational fishermen to the inner perimeters of either 30 fm (Alt. 1) or 40 fm (Alt 2), bycatch of cowcod would be expected to increase by some amount under any of the alternatives. Although Action Alternative 1 (the four-area alternative) would presumably have less of an impact with respect to the potential for increased cowcod mortality, all of the areas proposed in this alternative are described as areas of moderate to high densities based on CDFG fishing block catch rate data (figures 5 and 6 in Appendix IV of Piner et al. 2006). Additionally, Potato Bank (west of San Nicolas Island), as well as Cortes Bank were both observed to have high densities of adult cowcod in the recent submersible survey {Yoklavich et al., in prep}. Alternatives 2 and 3 could be expected to have increasingly higher impacts on cowcod as they increase the areal extent of cowcod habitat open to fishing significantly to substantially.

Both Potato Bank and the Santa Barbara Island areas, that would be open in all alternatives but the No Action Alternative, were also recently described as areas with high concentrations of newly described species of black corals {Tissot et al. 2006}, for which nearly all of the high concentrations were observed within the current boundaries of the CCA. Independent of the above concerns, it is worth noting that a growing amount of habitat information in the Southern California Bight may be informative with respect to altering the CCA boundaries in the near future. Additional analysis of such data, and associated habitat preferences by cowcod and other species, could more adequately ensure that habitat known to be optimal for cowcod is protected in future CCA revisions.

With respect to monitoring stock abundance and recovery, changing the boundaries of the CCA could undermine the ability to replicate recent resource surveys, such as the submersible survey and the enhanced CalCOFI ichthyoplankton survey. In particular, the submersible survey conducted by Yoklavich et al. (in prep) was used in the last assessment as a single point estimate of abundance of a given year within the CCAs, expanded by a scaling factor developed based on catch rate data in recreational fisheries. Both the STAR Panel and the SSC report on the cowcod assessment stressed the paucity of data available for this stock, highlighted the potential of this survey for monitoring cowcod trends, and emphasized the need for a consistent time series in order for this survey to be relied upon with confidence for detecting trends. Specifically, alterations to the boundaries of the CCA could undermine the assumptions necessary to replicate this survey in order to develop a second data point for monitoring stock trends. In other words, a second survey may not be comparable with the first, if the conditions (exploitation rates) within the survey area had changed.

This is a particularly important factor given that the four fishing areas proposed under Alternative 1 include three of the eight banks upon which the 2002 visual survey was based; Potato Bank, Santa Barbara Island, and Cortes Bank. The cowcod assessment represents one of the most data-poor assessments in the recent assessment cycle, such that only three free parameters (R_0, steepness and the catchability coefficient for the visual survey) were actually estimated in the model. Aside from the submersible survey, there are no fishery independent data to inform the assessment (in the most recent assessment review, the STAR Panel recommended removal of the CalCOFI time series that was used in the first assessment), nor are there length-frequency data or other information to estimate recruitment variability. As catch rate data were effectively the most important time series index in the assessment, the submersible survey offers one of very few potentially available data series for monitoring stock trends and recovery. Given the paucity of data available for the cowcod assessment, it will be important to attempt to maintain consistency in management measures (to the extent practicable) until an effective monitoring system is in place.

The magnitude of fishing that could take place under any of the action alternatives, and the extent to which such fishing could increase mortality on cowcod and other rebuilding species, will be particularly difficult to assess without adequate observer coverage on vessels that fish within these closed areas. The current cowcod OY could potentially be entirely harvested in a small number of "disaster sets", and the extent to which any observer data that was collected would over, or under, estimate cowcod mortality is difficult to detect with the limited observer coverage for this region. Consideration of the challenges associated with adequately monitoring total mortality that could result from any modification to the CCA should be a high priority in selecting a preferred alternative, including some evaluation of the amount of observer coverage that might be expected from the WCGOP under any of the alternative scenarios.

Enforcement issues are presumably challenging under the proposed alternatives to the status quo. The current boundaries have been shown to be easily understandable to fishermen and enforcement personnel, thus meeting their objectives in rebuilding the cowcod (and other) resources. The practicability of enforcement using VMS data, particularly with respect to the legal issues surrounding the ability of states to use proprietary VMS data for enforcement purposes, is another complicating factor that has yet to be resolved for the purposes of implementing the Alternatives. This, and additional challenges to enforcement that could be associated with any perimeter modification, should also be carefully considered prior to any adoption of proposed alternatives to status quo.

Darkblotched Rockfish

Specific Darkblotched Rockfish Rebuilding Strategies

Darkblotched rockfish are caught almost exclusively by groundfish trawl gear and predominantly bottom trawls operating on the outer continental shelf and slope north of 38° N latitude between 100 and 200 fm (Figure 4-3). The two most significant strategies used to control darkblotched fishing mortality are limited entry trawl trip limits for the southern and northern minor slope rockfish complexes, the complexes in which darkblotched are managed, and implementation of the trawl RCA, where modifications to the seaward boundary tend to have the greatest effect on darkblotched take. As an example, in 2004 the Council and NMFS decided to provide more opportunity to harvest healthy Dover sole, thornyheads, sablefish (DTS), and flatfish stocks in the limited entry trawl fishery while staying within the darkblotched OY of 240 mt. In May the trawl RCA was decreased by moving the seaward boundary inshore to 150 fm and increasing DTS and flatfish limits. By September it was apparent the darkblotched OY would be exceeded without a significant adjustment to the trawl fishery. The trawl RCA was then extended from the shoreline (primarily to address over-attainment of canary rockfish) out to 250 fm north of 40°10' N latitude, from the shoreline out to 200 fm between 38° N latitude and 40°10'

N latitude, and trip limits were severely reduced. The very important winter petrale sole fishery was foregone among other important fishing opportunities. By the end of the year, the darkblotched OY was exceeded, but only by 1.6 mt (Table 4-6). This indicates the sensitivity of RCA boundary adjustments when managing fisheries to stay within low darkblotched rockfish rebuilding OYs.

Area management beyond adjustment of the seaward boundary of the trawl RCA may be an effective rebuilding strategy for darkblotched rockfish. Figure 4-3 indicates an apparent clustered distribution of darkblotched as evidenced by area-specific catch per tow data in past NMFS trawl surveys. While the clustered distribution of darkblotched in Figure 4-3 is informative, the apparent distribution is also affected by the survey sampling regime in that not all of the combined survey data is shown, 0-catch hauls are not shown, and that the depths and latitudes sampled by all surveys have been irregular over time. In 2004, observers noted two very large catches (8,000-15,000 lbs), which were partially discarded {Rogers 2006}. They were both from an area that also had large survey catches at approximately 40.5° N latitude in 200 fm (Figure 4-3). These large catches tended to contain larger than average fish {Rogers 2006}. Closure of those areas might provide additional darkblotched conservation benefits.

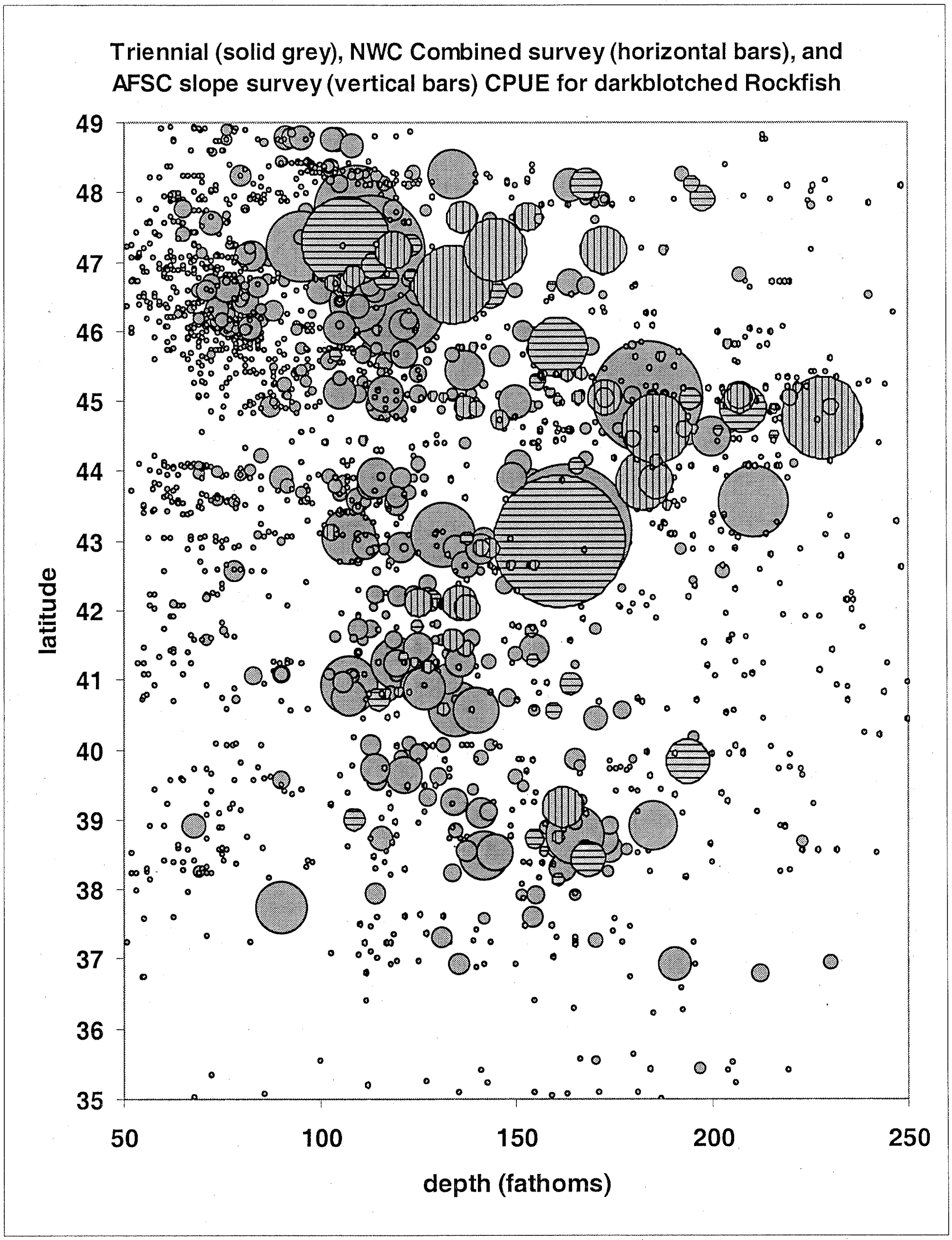

Figure 4-3. Index of West Coast distribution of darkblotched rockfish by latitude and depth as determined by catch per tow in NMFS trawl surveys. Size of circle is proportional to darkblotched rockfish density at that location. Data from NOAA Northwest Fisheries Science Center's West Coast Groundfish Survey Database and the NOAA Alaska Fisheries Science Center Triennial Shelf and Slope Survey Database.

Evaluation of Optimum Yield Alternatives

Table 4-11 shows the results of the evaluation of alternative darkblotched rockfish OYs analyzed for 2007-2008 using the criteria described in section 4.2.

The much more optimistic 2005 darkblotched assessment is largely based on validation of strong recent recruitments. These recruitments are relatively certain in the assessment input data despite the inconsistency in assigned ages of darkblotched in the sample data, which leads to the ranking of "moderate" assessment uncertainty.

The catch monitoring of darkblotched is relatively certain since the limited entry bottom trawl fishery takes the vast majority of the total annual take while targeting DTS and flatfish species on the slope. Estimation of at-sea discards of darkblotched and other species in the trawl fishery has become increasingly certain with the increased observations from the WCGOP. The overfishing of darkblotched that occurred in 2004 (Table 4-6) may be prevented in the near future since model projections using WCGOP discard rates are better informed and landings plus discard are now tracked in near-real time in PacFIN's Quota Monitoring Species (QSM) reports[5].

All the darkblotched OY alternatives have exceptionally high rebuilding probabilities at or approaching 100%. The range of most depleted species' OYs analyzed in this EIS have an OY alternative at or close to 50% P_{MAX}. Conversely, the highest darkblotched OY alternative has a very high 97% P_{MAX} since it is capped at the ABC, which is determined using a proxy harvest rate. Therefore, all the harvest rates used to determine alternative darkblotched OYs and rebuilding strategies are considered risk-averse using this evaluation criterion.

The rebuilding periods associated with alternative darkblotched OYs are relatively short for a depleted rockfish. Under the zero-harvest alternative, rebuilding is predicted to occur by 2009.5. The Preferred Low OY Alternative of 130 mt extends this rebuilding duration by less than half a year, while the Preferred High OY Alternative of 229 mt extends rebuilding by slightly more than half a year. This compares to rebuilding duration beyond $T_{F=0}$ under the status quo OY of slightly more than half a year (equivalent to that under the Preferred High OY) and 2.5 years of extended rebuilding under the largest OY considered of 472 mt. The tradeoff in rebuilding duration vs. allowable darkblotched harvest shows that a greater harvest rate than has been sustained in recent years can still successfully rebuild the darkblotched rockfish stock with a small incremental increase in the rebuilding period. While these strong, incoming year-classes to the spawning stock biomass favor expeditious rebuilding, fishery interceptions of darkblotched will likely increase making it more difficult to manage the low status quo OYs using status quo management measures.

5 The GMT uses the PacFIN QSM report to track OY attainment inseason for recommending adjustments to fisheries to stay within OYs. In 2005, the GMT started incorporating projections of discard mortality in association with landings in the QSM report to better track total fishing-related mortality of managed species.

Table 4-11. Evaluation of alternative 2007-2008 darkblotched rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)					
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**OY Alt. 2 (Pref. Low OY)**	**OY Alt. 3 (Pref. High OY)**	**OY Alt. 4**	**OY Alt. 5**
	200	0	**130**	**229**	330	472
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.					
Assessment Uncertainty	Moderate uncertainty due to data inconsistency (ageing uncertainty).					
Rebuilding Probability (P_{MAX})	100%	100%	100%	100%	100%	97.2%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	0.6	0	0.4	0.7	1	2.5

Evaluation of Action Alternatives

All of the action alternatives analyzed for 2007-2008 contemplate more conservative management of slope trawl fisheries than status quo. Action Alternative 1 is the only alternative estimated to stay within the Preferred Low OY Alternative for darkblotched, but as can be seen in Table 2-14, the Preferred Low OY Alternative for POP is even more constraining to slope trawl fisheries. Action Alternative 2 and 3 stay within the Preferred High OY for darkblotched, but the Preferred High OY for POP is again more constraining (Tables 2-19 and 2-21).

The more effective and accurate catch monitoring and tracking mechanisms used to manage slope trawl fisheries should significantly improve inseason management adjustments to future trawl fisheries and thus avoid the overfishing problem encountered in 2004. Inseason adjustments are anticipated to be fundamental in managing trawl fisheries to stay within whatever darkblotched OY is chosen for 2007-2008 as increased encounter rates of darkblotched are expected with the strong recruitments observed in the latest assessment.

Pacific Ocean Perch

Specific Pacific Ocean Perch Rebuilding Strategies

Pacific ocean perch have been under rebuilding since 1981. The population off the northern U.S. West Coast (Columbia and U.S./Vanc. areas) is at the southern extreme of the stock and rebuilding potential may be more effected by mortalities in waters north of the U.S./Canada border. Nevertheless, the trawl RCA configuration used to reduce darkblotched mortalities, which has been the more constraining stock in slope trawl fisheries since implementation of rebuilding measures in 2001, has significantly reduced POP mortalities. Continued use of RCA management coupled with precautionary slope rockfish trawl trip limits may be the most effective combination of strategies available to the Council and NMFS for rebuilding this stock. Given the stock's overall distribution in the Northeast Pacific, a collaborative U.S./Canada research and management plan needs to be explored.

Evaluation of Optimum Yield Alternatives

Table 4-12 shows the results of the evaluation of alternative POP OYs analyzed for 2007-2008 using the criteria described in section 4.2.

Both catch monitoring uncertainty and assessment uncertainty are relatively low for this species given the fact that the vast majority of total fishing-related mortality occurs in limited entry bottom trawl efforts.

Rebuilding probabilities range from 50% to 100% across the range of analyzed POP OYs and are especially high (>95%) for the Preferred Low and High OY Alternatives. This compares to a 73% P_{MAX} under the status quo OY of 447 mt, which is almost 4.5 times higher than the Preferred High OY Alternative.

The shortest possible time to rebuild the West Coast POP stock under a zero-harvest strategy is 2014.6. The Preferred Low OY Alternative extends rebuilding by less than half a year longer and the Preferred High OY Alternative extends rebuilding by approximately one year. This compares to about 8 years of extended rebuilding under the status quo OY and over 30 years under the harvest rate used to determine the highest OY considered (OY Alternative 5).

Table 4-12. Evaluation of alternative 2007-2008 Pacific ocean perch OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)							
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**Pref. Low OY Alt.**	**OY Alt. 2**	**Pref. High OY Alt.**	**OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**
	447	0	**44**	87	**100**	405	514	749
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.							
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.							
Rebuilding Probability (P_{MAX})	73%	100%	99.5%	96.7%	95.8%	80%	70%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	7.9	0	0.4	0.4	1	6	10	33

Evaluation of Action Alternatives

In recent years, the effective harvest rate of POP in trawl slope fisheries has been much less than that specified in the POP rebuilding plan because darkblotched OYs were more constraining. The Preferred Low and High OY alternatives are much lower than the No Action OY and, depending on the harvest rate decided for the darkblotched rockfish rebuilding plan, could become the constraining stock in future trawl slope fisheries in waters off Oregon and Washington.

Only Action Alternative 1 constrains fisheries enough to stay within the Preferred Low OY Alternative for POP, while Action Alternatives 2 and 3 stay within the Preferred High OY.

Widow Rockfish

Specific Widow Rockfish Rebuilding Strategies

The Council chose to eliminate the non-tribal midwater trawl fishery targeting yellowtail and widow rockfish in 2003 to reduce widow rockfish exploitation {PFMC 2003}. The WDFW sponsored a midwater trawl EFP in 2002 and 2003 to attempt to shape a fishery that effectively targeted yellowtail while avoiding widow. However, this EFP was discontinued prematurely in 2003 because about 28% of the catch was widow rockfish (B. Culver, personal communication). There is still a tribal midwater trawl fishery that targets yellowtail rockfish, but incidentally catches some widow rockfish. The 2005-2006 limits for this fishery were a fleet-wide (the Makah Tribe was the only tribe prosecuting a midwater trawl fishery) cumulative landing limit of 180,000 lbs of yellowtail rockfish/two months. Widow rockfish landings were limited to 10% of the weight of yellowtail rockfish landed in any two-month period. These midwater landing limits were subject to inseason adjustments to minimize the take of canary and widow rockfish. Management of the tribal midwater trawl fishery is designed to minimize impacts to canary and widow rockfish through avoidance. Observer data is analyzed daily and vessels are told which areas to avoid when these species are encountered.

The Council also chose to manage widow rockfish bycatch beginning in 2004 by precautionary management of midwater trawl fisheries that target Pacific whiting. This has traditionally been the fishery with the greatest incidental bycatch of widow rockfish, excluding the directed yellowtail/widow midwater trawl fishery which was discontinued in 2002. While the shoreside whiting sector has exhibited a clear recent trend of reduced widow rockfish bycatch, widow bycatch in the at-sea sectors has been more random. All whiting trawl sectors showed a significant decrease in widow rockfish bycatch in 2003 (Figure 4-4). The at-sea vessels receive daily reports of bycatch by vessels in their fishery, where there is 100% observer coverage, and actively avoid areas where there has been a high bycatch of salmonids, widow, and yellowtail rockfish. Another contributing factor to the lower widow bycatch in 2003 was a significantly increased abundance of whiting in 2003 which resulted in shorter tows to fill trawls. In years when whiting are less abundant and more dispersed, widow bycatch can become an increasing concern as vessels extend their search for whiting schools and have longer tow times (D. Myer, personal communication). Shorter tows on aggregated whiting schools would sensibly reduce widow bycatch since whiting tows are made in daylight hours when widow rockfish are dispersed. There was also a greater abundance of whiting off the north Washington coast in 2003 that kept at-sea whiting vessels more northerly and away from Oregon and southern Washington coastal areas where widow are more abundantly distributed.

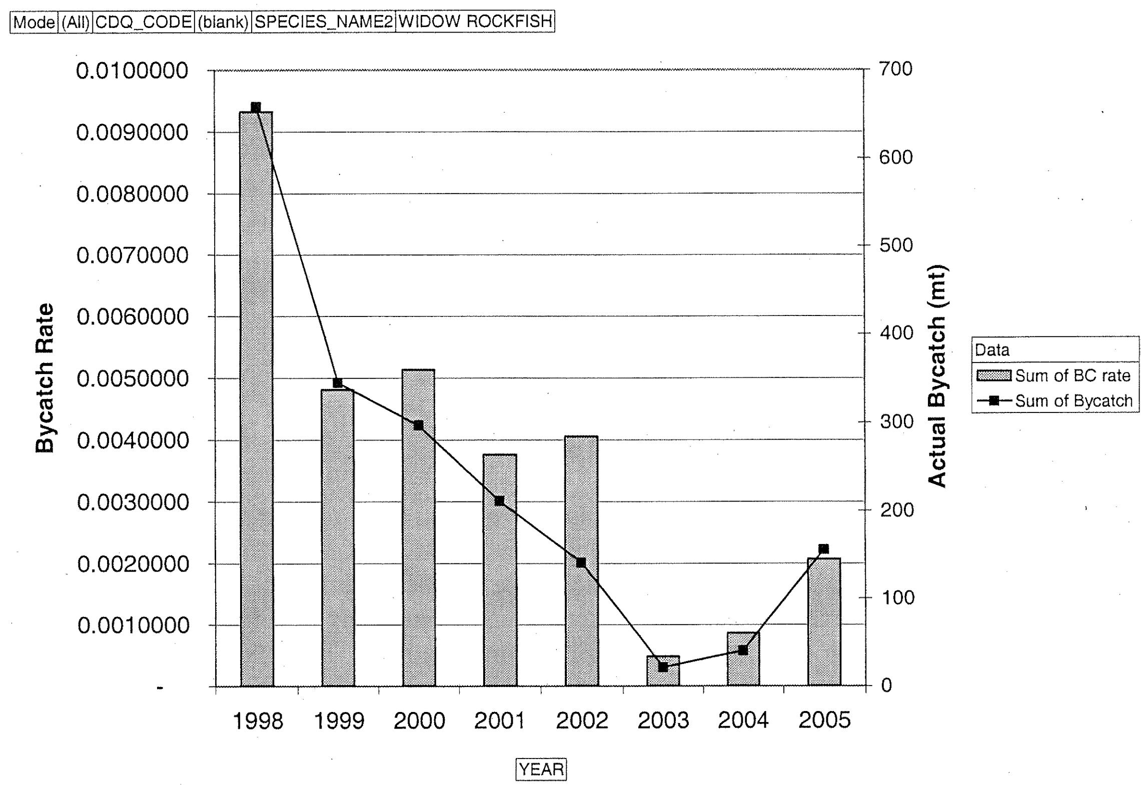

Figure 4-4. Annual Widow Rockfish Bycatch Rate and Bycatch in the Non-tribal Sectors of Whiting-directed Midwater Trawl Fisheries.

In recent years, the GMT has recommended consideration of the following management strategies to reduce widow rockfish bycatch in whiting fisheries: 1) a precautionary reduction in whiting OYs, 2) hard widow rockfish bycatch caps by sector in the whiting fisheries or a hard cap imposed for all sectors combined, 3) establishing avoidance strategies by timely reporting of widow bycatch rates by area that would compel the fleet to move away from such areas, and 4) prohibiting the whiting fishery in areas of highest widow rockfish densities.

As stated above, the Council has elected to specify hard widow rockfish bycatch caps on the non-tribal sectors of the whiting fishery. It is noted that the majority of widow rockfish bycatch in whiting fisheries occurs infrequently in "disaster tows" that may be due to inexperience on the part of the skipper or an unpredictable encounter. Since each sector has a different season, it is conceivable that one sector could pre-empt fishing opportunities for another by experiencing a few "disaster tows." Originally, in 2004, the Council recommended hard bycatch caps for both canary and widow rockfish for all whiting sectors combined, including the tribal sector. However, in 2005, these hard caps were adjusted and implemented only for the non-tribal shoreside and at-sea sectors combined. The specified widow rockfish bycatch cap was originally 200 mt, but adjusted inseason to 212 mt. The 2006 cap was set at 200 mt. Managing the whiting fishery with hard bycatch caps has forced active avoidance of widow and, as Figure 4-4 indicates, has successfully reduced widow bycatch to desired levels. The strategy works due to timely reporting to the rest of the fleet of areas where higher widow bycatch occurred. The at-sea fleets (catcher-processors and motherships) have 100% observer coverage. They also have an independent contractor collect at-sea bycatch information daily, who reports back to the fleet when the bycatch of any particular species of concern rises in any one area. The fleet then moves to areas where whiting can be more cleanly targeted.

The shoreside sector has a similar mechanism for minimizing bycatch. This sector operates under an EFP that mandates full retention of species and landing of all the catch. This allows full sampling of the total catch upon landing. The buyer reports back to the fleet if a landing from a particular area shows a higher than desired bycatch. However, catch can be discarded at sea if landing the bag poses an immediate threat to vessel safety. Since the shoreside fleet does not operate with 100% observer coverage, there may be an incentive to discard at sea if a larger than expected bycatch of widow rockfish occurs. The NMFS started placing cameras on all shoreside whiting vessels in 2004 as an experimental effort to determine if discarding occurs on otherwise unobserved trips. In 2004, a total of 1,003 trips and 1,030 sets were observed using deck-mounted cameras. Non-retention occurred in 19% of sets observed. Most of this non-retention was from fish bled from the codend of the trawl, although some discard occurred from fish dumped off the deck. Most of the observed discards occurred during the last haul of the trip and most discards were < 45 kg total estimated weight. [2005 results?] Starting in 2006, camera monitoring is mandated in the Shoreside Whiting EFP.

An innovative government-industry collaboration coordinated by the NMFS Northwest Fishery Science Center, the Pacific Whiting Conservation Cooperative, and the Fisherman's Marketing Association was launched in 2004 to explore the development of an abundance index methodology specifically for widow rockfish. The goal of this effort was an exploration of non-extractive techniques using acoustics and cameras. This feature was viewed as particularly important owing to the depleted status of this species. As proof of concept, pilot survey work off Newport, Oregon in March 2005 confirmed the ability to reliably locate, observe, and quantitatively measure widow rockfish schools with conventional single frequency fishery acoustics techniques in combination with underwater video cameras. The sites sampled off central Oregon, a subset of those identified by fishermen in the ad hoc working group, were found to contain widow rockfish aggregations, which supports the strategy to rely on use of local fisherman's knowledge of fishing grounds as a sampling framework. The acoustics data collected with the scientific echosounder installed on a fishing vessel was of good scientific quality, which allowed a detailed examination of patterns of variability in widow rockfish populations (see report entitled "Update on the Development of a Commercial Vessel-Based Stock Assessment Survey Methodology for U.S. West Coast Widow Rockfish: A Report to the ad hoc Working Group" by P. Ressler, G. Fleischer and V. Wespestad). The success of the pilot work indicated that the acoustic surveys could be a successful monitoring tool but should be expanded to include other study sites along the West Coast in order to provide coastwide monitoring of the species. Such research is critical for determining a much needed, reliable index of widow rockfish abundance as the established NMFS bottom trawl is ineffective for this semi-pelagic species and fishery-dependent indices no longer reliably track abundance since the fisheries avoid widow rockfish. A reliable, fishery-independent survey will be a very important contribution to our understanding of stock status and trends, which should lead to better area management strategies for widow rockfish, as well as holding potential for other depleted rockfish.

Evaluation of Optimum Yield Alternatives

Table 4-13 shows the results of the evaluation of alternative widow rockfish OYs analyzed for 2007-2008 using the criteria described in section 4.2.

Catch monitoring of widow rockfish is relatively certain given that the stock is mostly caught as bycatch in trawl fisheries and is predominantly caught in whiting-directed trawl fisheries where at-sea observation rates are highest on the West Coast.

Conversely, the assessment result is relatively uncertain due to the lack of a reliable widow abundance index. In past assessments, widow bycatch in whiting-directed trawl fisheries has been used to understand biomass trends. However, with the need for whiting fleets to reduce their widow bycatch, that index is no longer recommended for assessing stock trends. The promise of an effective and useable hydroacoustic survey index is still many years off. The survey would have to be proven through continued research before managers and scientists invest in these resources. And, if that happens, multiple years of survey data would be needed before temporal biomass trends can be discerned and used in assessment. Therefore, assessment uncertainty is relatively uncertain, which should be considered when the Council determines a final rebuilding plan. (In fact, this uncertainty was taken into account when the Council decided not to pursue "delisting" widow rockfish as an overfished species given the assessment result that the stock never did reach a threshold of depletion below $B_{25\%}$. The Council understood there was very little new data informing this new assessment and acknowledged the uncertainty was too great to depart from the rebuilding plan.)

Most of the widow rockfish OY alternatives analyzed in this EIS have high rebuilding probabilities (P_{MAX} at or above 80%). Only OY Alternative 5 (1,369 mt) has a P_{MAX} less than the SSC "target" of ≥80%. The Preferred Low and High OY alternatives have very high rebuilding probabilities of 98% and 95%, respectively. In terms of the P_{MAX} criterion, the harvest rates used to determine these OYs are risk-averse rebuilding specifications.

The strong, year classes recruiting to the widow rockfish spawning stock are evidenced by the short rebuilding times predicted across a large range of OYs (Table 2-3 and Figure 2-2). The shortest possible time to rebuild the stock under a zero-harvest strategy is 2013. The Preferred Low OY harvest rate is predicted to extend rebuilding about a year longer than this and the Preferred High OY harvest rate extends rebuilding by yet another year. This compares to slightly less than two years of extended rebuilding under the status quo OY, which is intermediate to the Preferred Low and High OY Alternatives.

Table 4-13. Evaluation of alternative 2007-2008 widow rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)							
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**Pref. Low OY Alt.**	**OY Alt. 2**	**Pref. High OY Alt.**	**OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**
	289	0	**120**	329	**368**	456	917	1,369
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.							
Assessment Uncertainty	Relatively uncertain due to lack of a reliable abundance index.							
Rebuilding Probability (P_{MAX})	96.2%	100%	98.4%	95.7%	95.2%	94%	80%	60%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	1.8	0	1	2	2	3	7	14

Evaluation of Action Alternatives

All the action alternatives assume the same basic strategy of reducing widow rockfish mortalities by specifying caps in non-tribal fisheries targeting whiting. While other sectors may be able to reduce their impacts with widow avoidance strategies, the impacts in directed midwater trawl fisheries for whiting promise to most substantially reduce widow mortalities. The large recruitments of widow rockfish predicted in the new stock assessment may be a significant management challenge for the whiting fishery, depending on the widow harvest rate and OY selected for the widow rockfish rebuilding plan and the bycatch caps specified in future whiting fisheries.

Only Action Alternative 1 is conservative enough to stay within the Preferred Low OY Alternative for widow, while all the action alternatives stay within the Council's Preferred High OY Alternative. Managing for a 120 mt OY (Preferred Low OY) will most certainly constrain future whiting fisheries significantly given the OY is less than the status quo bycatch caps specified for 2005 and 2006 whiting fisheries. It will prove difficult, if not impossible for the whiting sectors to fully attain future whiting allocations if the cap is as low as it would have to be under the Preferred Low OY Alternative.

Yelloweye Rockfish

Specific Yelloweye Rockfish Rebuilding Strategies

Of all the new groundfish stock assessments conducted in 2005-2006, the yelloweye rockfish assessment shows the most pessimistic change from status quo. A significant adjustment of status quo management is needed to rebuild this stock given the much lower OYs projected from the new rebuilding analysis. While status quo management of yelloweye has relied on a similar avoidance strategy as is used to minimize cowcod mortalities (i.e., no retention regulations and specific area closures), there are still some fisheries, such as recreational and commercial fisheries in the north targeting Pacific halibut, that will need to be further constrained to stay within the lower OYs analyzed in this EIS. A more comprehensive area management strategy, where more of the critical habitats where yelloweye reside are closed to fishing efforts known to take yelloweye, may be most effective at further reducing mortalities and should be seriously considered. Other mechanisms, such as season and depth restrictions, should also be considered to reduce yelloweye mortality.

Yelloweye rockfish have a similar life history pattern as cowcod. They are sedentary and exhibit more side fidelity than most rockfish species. Prohibiting fishing activities that are prone to catch yelloweye in areas they frequently occur is likely to be one of the best strategies for minimizing total mortality. Broad, depth-based RCAs are effective at reducing fishing-related mortality, and, in fact, the seaward boundary of the non-trawl RCA north of 40°10' N latitude is configured to reduce mortality of yelloweye by fixed gears. However, specific yelloweye RCAs, like the existing one off the north Washington coast (Figure 2-3), are likely to be most effective at reducing incidental mortality in hook and line fisheries. Figure 4-5 depicts the relative density of yelloweye by depth and latitude as indicated by catch per tow in West Coast trawl surveys. Assuming the composite trawl survey CPUEs accurately represent yelloweye distribution, yelloweye RCAs north of 39° N latitude in depths out to 100-125 fm should provide the most protection for yelloweye against incidental exploitation.
Gear restrictions have been shown to be effective at reducing yelloweye mortality as well. Mandating small footrope and selective flatfish trawls shoreward of the trawl RCA has significantly reduced yelloweye mortality.

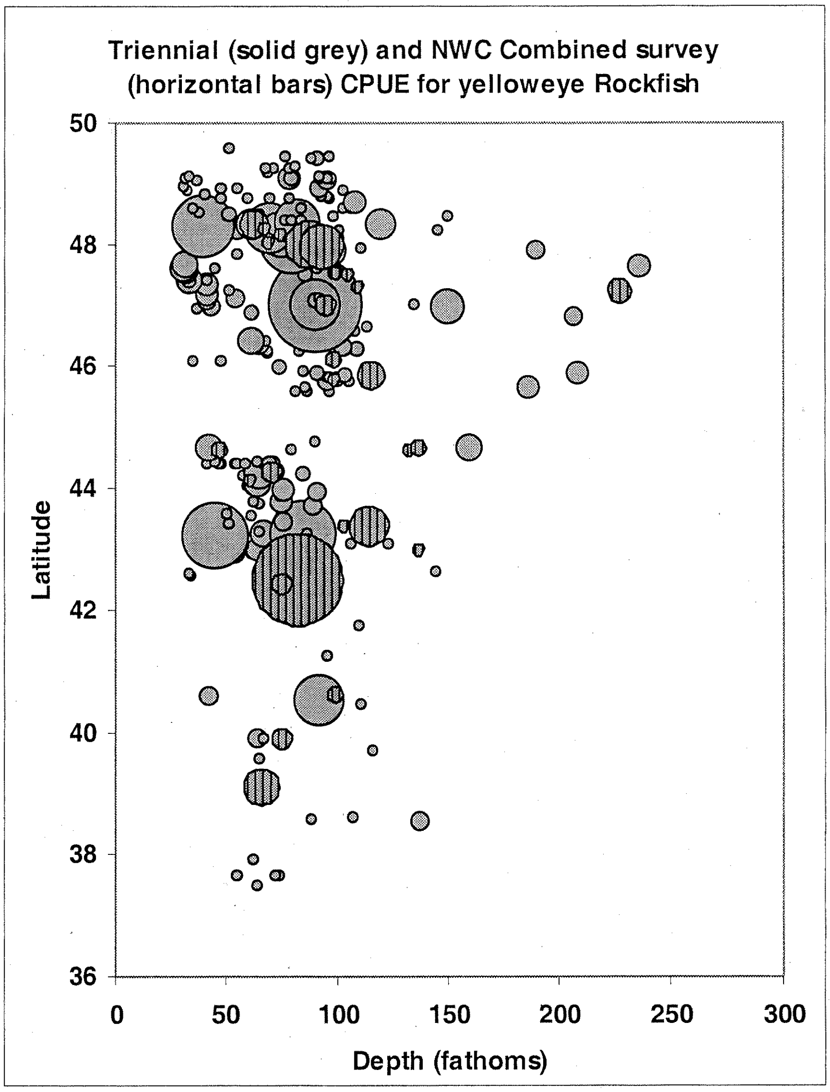

Figure 4-5. Index of West Coast distribution of yelloweye rockfish by latitude and depth as determined by catch per tow in NMFS trawl surveys. Size of circle is proportional to yelloweye rockfish density at that location. Data from NOAA Northwest Fisheries Science Center's West Coast Groundfish Survey Database and the NOAA Alaska Fisheries Science Center Triennial Shelf and Slope Survey Database.

Evaluation of Optimum Yield Alternatives

Table 4-14 shows the results of the evaluation of alternative yelloweye rockfish OYs analyzed for 2007-2008 using the criteria described in section 4.2.

There is considerable uncertainty in catch monitoring systems for tracking total catches of yelloweye. The sector currently taking the most yelloweye through unavoidable bycatch is the recreational sector targeting groundfish and Pacific halibut and, as pointed out in section 4.2, recreational catch monitoring is relatively uncertain. However, catch monitoring uncertainty is even more extreme for yelloweye since it is a rare species in the catch for any sector and, of the commercial sectors currently taking yelloweye, the fixed gear fisheries take the most and WCGOP at-sea observations are more sparse for fixed gear fisheries (particularly in the south). Precautionary management is called for with such high catch monitoring uncertainty.

The yelloweye rockfish assessment is also one of the more uncertain assessments done for West Coast groundfish since the fishery-dependent catch data are sparse and not well known and there is a significant lack of fishery-independent data in the assessment since survey bottom trawls do not catch yelloweye particularly well. The assessment is therefore tuned to highly uncertain recreational CPUE indices that may be more affected by past management restrictions and catch monitoring uncertainty than trends in stock biomass. This high uncertainty calls for precautionary management of stock rebuilding since the true state of nature may be more pessimistic (or optimistic) than the current assessment indicates.

Rebuilding probabilities are relatively high for the yelloweye OY alternatives considered for 2007-2008, ranging from 100% under the zero-harvest alternative to 80% for the Preferred Low OY and High OY alternatives. These preferred OYs are within the "target" range of 80% recommended by the SSC. This compares to about a 46% P_{MAX} under the status quo OY, which is under the lower legal limit of 50%. Of the two preferred OYs adopted for detailed analysis by the Council in April 2006, the Preferred High OY "ramp-down" strategy is slightly more risky in that it assumes a four-year transition from the current management regime before adopting a constant harvest rate strategy equal to that under the Preferred Low OY Alternative. Assuming the 2007-2010 OYs are not exceeded under the ramp-down strategy, there is no effective difference in P_{MAX} between the Preferred Low and High OY alternatives.

The relatively low productivity of the West Coast yelloweye stock predicts very long rebuilding periods. The shortest possible time to rebuild the stock under a zero-harvest strategy would be 2048 (Table 2-3). The harvest rate used to determine the 12 mt alternative (OY Alternative 2) is estimated to extend rebuilding an additional 30 years beyond that, while the Preferred Low OY and High OY alternatives are estimated to extend rebuilding an additional 35 and 35.5 years, respectively. This compares to over 71 additional years of rebuilding under the status quo harvest rate currently specified for rebuilding the yelloweye stock. The effect of a four-year transition from the status quo harvest rate to the low harvest rate under the Preferred Low OY Alternative is about a half a year of additional rebuilding under the ramp-down strategy.

Table 4-14. Evaluation of alternative 2007-2008 yelloweye rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)				
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**OY Alt. 2**	**Pref. Low OY Alt.**	**Pref. High OY Alt.**
	27	0	12	**12.6**	**Ramp down** a/
Catch monitoring uncertainty	Very high uncertainty due to a paucity of at-sea observations and a significant recreational catch component.				
Assessment Uncertainty	Very high uncertainty due to poor data quality.				
Rebuilding Probability (P_{MAX})	45.7%	100%	81%	80%	80% b/
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	71.5	0	30	35	35.5
a/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.					
b/ P_{MAX} (and the harvest rate beginning in 2011) are the same as for the Preferred Low OY Alternative.					

Evaluation of Action Alternatives

The very conservative management measures described under Action Alternative 1 in Chapter 2 are the only suite of management measures that are predicted to stay within the Council's Preferred Low OY Alternative. Management measures under Action Alternatives 2 and 3 stay within the OYs under the Council's Preferred High OY alternative, or the ramp-down strategy. Every action alternative specifies the implementation of a number of new Yelloweye RCAs to reduce mortality, but there is no quantifiable impact savings determined in this EIS from those proposed area closures. While it is unknown how overall total yelloweye mortality may be reduced by these YRCAs, some reduced mortality is anticipated and should be realized in 2007-2008 if these area closures are implemented. Reduced mortality should first be evidenced in decreased encounters in recreational fisheries in Washington and Oregon and reduced bycatch observed in the WCGOP, particularly in the limited entry and open access fixed gear sectors.

An important aspect of the YRCAs proposed for 2007-2008 is that comprehensive fishery and survey data are unavailable for understanding the distribution of critical yelloweye habitats. The proposed YRCAs under the 2007-2008 action alternatives emerged in consultation with fishermen in potentially affected commercial and recreational sectors as areas where they have traditionally encountered yelloweye. Many of these proposed RCAs are within the habitats of greatest yelloweye density as inferred from trawl survey CPUEs (Figure 4-5). A larger, less fragmented area management strategy may ultimately be more effective for rebuilding the yelloweye stock since it would likely reduce mortalities by protecting the most critical habitats yelloweye reside and will be easier to enforce. However, the YRCAs currently proposed is a good first start in transitioning to a significantly lower harvest rate. If closing only these proposed areas is deemed insufficient for getting to lower OYs, then conservative inseason depth and season restrictions will be needed to stay within these rebuilding limits.

All the action alternatives contemplate stringent yelloweye harvest guidelines, which would force conservative inseason adjustments to those sectors experiencing difficulty avoiding yelloweye impacts.

4.3.1.2 Impacts of Rebuilding Alternatives

As explained in 2.1.1, rebuilding alternatives (Table 2-2b) were developed by arranging the depleted species' OYs in various combinations in order to understand how the rebuilding plans for different species interact to cumulatively constrain fishing opportunities. The description of each rebuilding alternative's impacts, below, is predominantly qualitative, as these suites of OYs were not crafted so that the Council would choose its depleted species OYs wholly from one of the alternatives. Rather, the function of the discussion below is to highlight, through its panoramic view across all depleted species, how each species might differentially constrain fishing opportunities by sector (or gear type) and region along the West Coast. Another point made in this section is that one depleted species (such as canary rockfish, which has a coastwide distribution and affects nearly all fishing sectors) can constrain opportunity in many sectors even if high OYs are selected for other co-occurring depleted species.

Rebuilding Alternative 1

Under Rebuilding Alternative 1, canary rockfish is a constraining species limiting both the commercial and recreational sectors. For limited entry bottom trawl, the canary rockfish OY limits the catch of target species, such as petrale and Dover sole in the summer months, as well as English sole, arrowtooth flounder, and Other Flatfish on the continental shelf. Applying depth restrictions is the primary management tool to reduce the impact of limited entry fixed gear and open access fisheries on depleted species. The canary rockfish OY, as well as the yelloweye rockfish OY, could cause these fisheries to be restricted to depths greater than 100 fm north of 40°10' N latitude (rather than 100 fm under status quo).

Although the canary rockfish OY is the primary constraint on the recreational sector, yelloweye rockfish is also a constraining species for the sector, especially for recreational fisheries in Washington and Oregon. For California recreational fisheries, the bocaccio OY also substantially constrains opportunity. Affected recreational fisheries include those targeting black rockfish, blue rockfish, cabezon, lingcod, Pacific halibut, and greenling. In general, management measures that would be needed under this alternative, in order to restrict encounters with canary rockfish, would be similar to those under Action Alternative 1 (see section 4.3.1.1). However, a greater impact to yelloweye rockfish would be possible under this alternative than is expected under Action Alternative 1. This could allow for less restrictive management measures in some sectors, particularly Washington and Oregon recreational fisheries.

Canary rockfish also constrains the whiting fishery. Given recent bycatch rates, canary rockfish could constrain the whiting fishery to a catch at a level approximately two thirds of the 2006 Pacific whiting OY. However, the whiting fleets have avoided many of the impacts to depleted or protected species through innovative bycatch reduction techniques, such as near real-time reporting of bycatch and voluntary fleet mobilization when bycatch in a particular area is high. In the past two years, setting bycatch caps for the non-tribal whiting sectors has effectively minimized the bycatch of depleted groundfish species.

The bottom trawl fisheries on the continental slope become more liberalized under this alternative. As a result, the available OYs for two of the main deepwater target species, petrale sole and sablefish, are able to be nearly or fully achieved. Given this more liberal scenario, it is the precautionary species, petrale sole and sablefish, which become constraining to fishing opportunities for other target species in limited entry bottom trawl, such as Dover sole and thornyheads. Nevertheless, the catch of Dover sole and thornyheads can still occur at levels equal to or higher than status quo levels. Species that have a high degree of co-occurrence with darkblotched rockfish (particularly those within the slope rockfish complex) are caught at levels that are substantially less than the available OY for those species. As has been the case in recent years, the POP OY is greater than that which can be accessed by these fisheries, given the constraints of other co-occurring species.

This alternative contains a widow rockfish OY that is higher than status quo; the OY is also greater than the estimated impact from the whiting fishery, the primary sector to catch widow incidentally. However, a midwater yellowtail rockfish and widow rockfish fishery cannot be re-introduced because the fishery's anticipated bycatch of canary rockfish could not be accommodated under this alternative's canary rockfish OY.

Rebuilding Alternative 2

Under Rebuilding Alternative 2, the northern fisheries that operate along the continental shelf and in nearshore areas are particularly constrained. The canary rockfish OY is set at a status quo level within this alternative, and therefore the impacts to fisheries would be expected to be similar to that seen under the current management. The yelloweye rockfish OY in this alternative, however, is set to a level lower than status quo (and also lower than under Rebuilding Alternative 1). Since yelloweye rockfish is caught almost exclusively by line gear, this alternative is particularly constraining to northern fixed gear and recreational fisheries. In order to lower the incidental catch of yelloweye within the recreational sector, the groundfish and, in northern waters, the Pacific halibut fishery would have to be restricted to shallower depths (potentially ≤20 fm) and/or new yelloweye RCAs would need to be established in areas of high yelloweye density where recreational bottom fishing would be prohibited. One possibility to reduce the limited entry and open access fixed gear impact on yelloweye rockfish would be to extend the non-trawl RCA seaward north of 40°10' N latitude, although establishing yelloweye RCAs could also help reduce impacts. The management measures to restrict impacts to canary rockfish and yelloweye rockfish under this alternative would be similar to those under Action Alternative 3.

Pacific ocean perch and darkblotched rockfish constrain bottom trawl fisheries along the northern slope areas to the same extent as under status quo management. Management measures under this alternative would also be similar to those described in Action Alternative 3. Similar to the case in Rebuilding Alternative 1, petrale sole and sablefish somewhat constrain the catch of other target species in the deepwater bottom trawl fisheries, such as Dover sole and thornyheads. However, the catch of these species is equal to or higher than the amount of catch occurring under status quo management. The whiting fishery operates as it would under status quo because its constraining bycatch species (canary rockfish, widow rockfish, and darkblotched rockfish) do not change under this alternative.

This alternative liberalizes the southern fisheries by increasing the bocaccio and cowcod OYs relative to status quo, although nearshore and shelf fisheries would still be constrained by canary rockfish, given the species coastwide distribution. Recreational fishermen in California, for example, might be able to fish at deeper depths or have a slightly longer season under this alternative. However, given the bocaccio OY is only slightly higher than the status quo impacts of about 150 mt of bocaccio in all fisheries combined, these increased opportunities might be slight. This is especially true if a strong year class of bocaccio is caught at a higher rate in nearshore fisheries, creating a temporary increase in bocaccio mortality until the fish mature and move to deeper depths.

Rebuilding Alternative 3

Rebuilding Alternative 3 is the most liberal of all of the rebuilding alternatives. Only the yelloweye rockfish OY specified within this alternative is less than that under status quo (although not much different than the realized status quo total mortality); some of the other OYs are substantially greater than those under status quo. This alternative provides for greater opportunities than those found in any of the Action Alternatives or in status quo management measures.

This alternative has the highest attainment of target species for most of the commercial sectors compared to other rebuilding alternatives, although current constraints on fisheries posed by low yelloweye OYs would not be lifted. Nevertheless, multiple target species OYs are not fully attained because the catch of precautionary zone target species caught in the commercial fishery (i.e., petrale sole and sablefish) limits the catch of healthy target species such as Dover sole and thornyheads. Commercial fixed gear fisheries, on the other hand, would continue to be constrained by the yelloweye rockfish OY.

Additional target opportunities could be accommodated under this alternative. For example, a midwater trawl fishery for yellowtail rockfish is possible, given that the widow rockfish OY is large enough to allow targeting and the canary rockfish OY is high enough to account for impacts that would be expected due to the co-occurrence of the three species. Only under this alternative would catch of widow rockfish approach the level of the OY; under the other alternatives (as well as under status quo) the widow rockfish OY is too low to allow this yellowtail rockfish target opportunity. The highest widow rockfish OY that could be considered in the new rebuilding analysis (1,369 mt) cannot be considered since canary rockfish would constrain midwater trawl opportunities, even under the higher amount under this rebuilding alternative (68 mt) before that amount of widow rockfish would be incidentally caught. The whiting fishery, which currently takes the greatest amount of widow rockfish, would be much less constrained by widow rockfish or canary rockfish under this alternative.

Northern recreational fisheries are still constrained by the yelloweye rockfish OY under this alternative. However, the effect on the fisheries may be mitigated by the higher canary rockfish OY in that management measures could direct fisheries away from areas with high yelloweye bycatch even if this increased the bycatch of canary rockfish. Depending on the management measures used to constrain the fisheries, fisheries directed toward black rockfish, Pacific halibut, lingcod, and greenling, amongst others, could be affected. Since yelloweye is rarely caught south of Cape Mendocino (40°10' N latitude), southern recreational fisheries are more liberalized under this alternative than under any of the other alternatives.

Rebuilding Alternative 4

Rebuilding Alternative 4 constrains the catch of target species for northern fisheries. Like in Rebuilding Alternative 1, the canary rockfish OY is almost one-half of status quo; however, the yelloweye OY is less than half of status quo, a more significant reduction than that analyzed under Rebuilding Alternative 1.

The OY for darkblotched rockfish is about double that of status quo and the OY for POP is nearly five times status quo. Given this scenario, the trawl fishery would need to shift away from the nearshore and shelf, where bycatch of canary rockfish is high, and into deeper waters where darkblotched encounters are greater (but are accommodated under this alternative). The result of this shift is to limit the catch of many commercially caught shelf and nearshore target species such as petrale and Dover sole in the summer months, English sole, arrowtooth flounder, and Other Flatfish. The midwater trawl fishery for Pacific whiting is similarly constrained under this alternative as it would be under Rebuilding Alternative 1. With a low canary rockfish bycatch cap, it is possible for the non-tribal sectors of the fishery to be closed before reaching their whiting allocations. However, the fishery's demonstrated ability to reduce its bycatch of overfished species in recent years suggests that such a situation may be averted.

Commercial fixed gear and open access fisheries coastwide are constrained significantly by this alternative, due to their encounters with canary and yelloweye rockfish. Management measures would likely be similar to those described under Action Alternative 1, in which the seaward boundary of the non-trawl RCA is extended from 100 to 150 fm north of 40°10' N latitude.

Recreationally fisheries are restricted substantially or eliminated completely under this alternative due to the low canary rockfish and yelloweye rockfish OYs. This affects both bottomfish fisheries (such as black rockfish, blue rockfish, cabezon, and lingcod) as well as other recreational fisheries that catch canary rockfish and yelloweye rockfish incidentally (such as Pacific halibut). In all instances, the OYs for these target species remain largely uncaught. Although yelloweye rockfish is generally only encountered north of Cape Mendocino, canary rockfish is caught nearly coastwide (it is rarely encountered south of Point Conception). Only for these most southern fisheries, can a more liberal season be considered given the higher bocaccio and cowcod OYs.

Unlike the southern commercial fixed gear fisheries, bottom trawl fisheries in the south are relatively unconstrained under this alternative, as the bocaccio OY is approximately twice that of status quo. As a result, the attainment of target species by the southern trawl fishery is largely limited by the attainment of precautionary zone target species OYs (petrale sole and sablefish).

Rebuilding Alternative 5

The OYs under Rebuilding Alternative 5 constrain all sectors of the groundfish fishery coastwide. Yelloweye rockfish, Pacific ocean perch, canary rockfish, darkblotched rockfish, and bocaccio all constrain the catch of more abundant species as well as the remaining two rebuilding species, widow rockfish and cowcod. No target species are constraints under this alternative, and none of the target species' OYs are attained.

The complexity of managing the fisheries increases substantially under this alternative. For example, it is difficult for managers to shift a fishery from an area where the catch of a depleted species has been exceeded into another other area where less constraining depleted species are found because nearly all of the depleted species are equally constraining. This type of situation would likely bring about the early closure of some fisheries in order to avoid exceeding the rebuilding OYs.

4.4 Discussion of Cumulative Impacts

A number of natural and human-induced factors affect the status of a stock. Through data such as commercial and recreational catch estimates, length at age distributions, and larval distribution and abundance, past effects on a stock's productivity and mortality are incorporated into stock assessments and their associated rebuilding analyses. That is, a final estimate of a stock's biomass reflects the wide number of human and natural effects on the stock, both in the past and at the present time, even if these factors are not estimated explicitly in the model. (Although uncertainty with respect to the estimates in the assessments (see section 4.2) and only nascent understanding of the relationship between environmental conditions and stock status increases an assessment's overall uncertainty.) Given that the findings from a stock assessment provide the scientific basis upon which harvest specification decisions are made, it is assumed here that that the impacts of the effects found within stock assessment models are already adequately accounted for within the analysis of this action. This section, therefore, addresses factors that may impact affected species, but which are not explicitly accounted for in the stock assessments. These factors may affect a species in a number of ways, including contributing to the uncertainty that a harvest specification will maintain or rebuild the affected species' population levels and changing the genetic structure of a stock.

The actions discussed below are divided into two categories, *internal* and *external*. *Internal* refers to actions implemented as part of the management regime, while *external* refers to actions of other agencies, organizations and individuals, including broad natural or socioeconomic effects.

4.4.1 Internal Factors

4.4.1.1 VMS Implementation

In order to enforce compliance with depth-based and area-based restrictions, a common tool in management under the Groundfish FMP, a Vessel Monitoring System (VMS) program has been implemented over the past few years. In 2004, NMFS initiated a pilot program requiring all limited entry trawl and fixed gear vessels operating under the Groundfish FMP to carry and use Vessel Monitoring System (VMS) units. Beginning in 2007, this program will be expanded to include all commercial vessels that take and retain, possess, or land federally-managed groundfish species taken in federal waters or in state waters prior to transiting federal waters. Because the vessels must utilize VMS, compliance by limited entry vessels is assumed in the analysis of impacts of depth-based restrictions on affected species; therefore, the effects of the limited entry sectors' used of VMS are already considered under the current action.

The expansion of VMS into the directed open access sector in 2007, however, is considered to be a future action that may affect West Coast groundfish species. VMS deters mixed fishing strategies where vessels alter gear to catch groundfish within the RCAs. As a result, under VMS the risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs is reduced. Nevertheless, the behavior of the open access fleet under VMS can only be speculated; for example, the requirement may encourage additional targeting of groundfish by certain vessels in order to compensate for the cost of the VMS equipment. A potential indirect impact of VMS expansion is that fishing effort and location data from the vessels may improve the understanding of groundfish mortality. Data can be combined with observer, survey, and fish ticket data to better estimate total fishing mortality, impacts on juveniles and other fishery resources related to changes in fishing locations and intensity, fishing intensity (amount of time vessels are in an area), and changes in fishing location and intensity over time.

4.4.1.2 Bycatch (Amendment 18)

The Council has undertaken a number of actions in response to the 1996 amendment to the Magnuson-Stevens Act requiring measures to reduce bycatch in U.S. fisheries, as well as to a related court case, *Pacific Marine Conservation Council v. Evans*. Amendment 18 will establish catch caps and increased monitoring policies in the Groundfish FMP in order to minimize bycatch in West Coast groundfish fisheries to the extent practicable, minimize the mortality of unavoidable bycatch, and ensure that bycatch is reported and monitored as required by law. Amendment 18 was approved by NMFS in 2006. By reducing bycatch and bycatch mortality and by increasing the accuracy of total fishing mortality estimates, these new policies complement ongoing actions to rebuild depleted species. As fishing mortality is decreased through more stringent harvest restrictions, the cumulative adverse effects of fishing and its associated bycatch diminish for both depleted and healthy groundfish stocks. Therefore, it is for the less conservative harvest specification alternatives that these bycatch minimization efforts will be particularly important in providing mitigation against adverse effects.

Bycatch minimization efforts should indirectly affect West Coast groundfish stocks by improving the data used in stock assessments. Assessment models will be tuned to more precise estimates of total catch levels, which will then benefit the management specification process that uses these findings. Given that Amendment 18 will not be implemented in time to influence the 2005-2006 stock assessment cycle, the concern that unreported bycatch may adversely impact the affected species is not fully addressed within this action.

4.4.1.3 Changes to the Management Regime: Open Access Sector License Limitation and Trawl Individual Quota System

The Council is currently considering alternatives that would establish at Trawl Individual Quota (TIQ) program, with an expected implementation date of 2010. In a related action, the Council is considering transitioning the open access directed groundfish sector into a permit system for landing groundfish. Both changes to the West Coast groundfish management structure are expected to improve the accounting of fishing mortality to assure that catches do not exceed harvest specifications. More accurate catch data also would be expected to bring about improvements to stock assessments by reducing the uncertainty surrounding catch data.

4.4.1.3 Area restrictions

Since 1998, progressively restrictive depth-based and area closures (most notably RCAs) have constrained fishing activity within smaller areas of state and federal waters. Though these closures are considered to be effective tools in limiting fishing interactions with depleted species, they are also responsible for shifting additional fishing pressure into other areas and onto other species.

For example, the Oregon recreational groundfish fishery has been closed offshore of 40-fm from June through September since 2004. It is likely that due to these closures, most anglers who would have fished offshore during the closure periods instead relocated their activities inshore. The effort shift onto nearshore species that resulted contributed to the early attainment of the black rockfish harvest cap in 2004 and 2005 and to the early closure of the recreational fishery in both years. A similar effect is noted in the California recreational fishery, in which the combined effects of federal RCAs and state marine protected areas have increased the pressure on nearshore stocks. For many of these nearshore stocks, there is little data to support an assessment of its stock status, suggesting that the effect of this effort shift is difficult to monitor.

It is expected that the effects of area restrictions will persist into the future; the effects may also become more acute if depleted species' OYs are further reduced in order to rebuild the species as quickly as possible. Furthermore, in addition to the possible future expansion of RCAs, the implementation of Amendment 19 (Essential Fish Habitat) will bring about other area closures in order to protect sensitive habitat from fishing impacts. For Washington recreational fisheries, for example, a closure of fisheries seaward of 10 fm would reduce the area available (inside 60 fm) by 84%, and a 20-fathom closure would reduce the area inside 60 fm by 74%. Allowing fishing only in these smaller areas could reduce the ability of anglers to target healthy fish stocks in traditional fishing areas. Analogously, fishing pressure on groundfish stocks that may have previously been spread over a broad area could become more concentrated, increasing the potential for localized depletion of some species.

4.4.2 External Factors

4.4.2.1 Short-term and Long-term Climate Variability: ENSO (El Niño) and PDO

Most commercially important fish and shellfish stocks in the California Current system, including many groundfish, are widely acknowledged to experience moderate to substantial variability in year-to-year recruitment success. Nearly all of these stocks (particularly those of winter-spawning shelf species) experienced high (positive) recruitment anomalies in 1999, and a great many of these stocks experienced high recruitment in 2000 as well. For many stocks, these year classes are a primary factor behind the increased abundance trends presented in Table 4-2. For example, the 1999 bocaccio year class was the largest since 1989, resulting in a near doubling of stock spawning biomass between 1999 and 2005.

Similarly, many stocks also demonstrated strong recruitment in 1970, 1980, 1984 and 1990, with weak year classes tending to occur in 1976, 1982-83, 1992-93 and 1997. Multivariate analysis of the stocks' recruitment deviations suggests that a significant amount of the observed variability in recruitment for West Coast groundfish can be explained by environmental conditions that have a very similar impact to a broad range of species across a fairly broad spatial scale. Such a conclusion is also supported by survey data; for example, the Southwest Fisheries Science Center's rockfish pre-recruit survey (1983-2005) detected a strong degree of covariance in the relative abundance of pelagic juvenile rockfish from 1983 through 2005. Although this survey failed to detect the magnitude of the 1999 year class, it does show strong interannual variability throughout the 1980s, followed by a precipitous decline in relative juvenile abundance through most of the 1990s, followed in turn by a return to highly variable (but often strong) recruitment in the post-1999 era.

The timing of these recruitment synchrony events maps well onto short-term and long-term changes in ocean conditions (for further background on the relationship between El Nino events and the Pacific Decadal Oscillation and ocean conditions, see section 3.1.3. Following an intensive 1997-1998 El Nino event, ocean conditions changed dramatically, and 1999 has been described as a year of transition in long-term (decadal scale, as associated with the Pacific Decadal Oscillation, or PDO) ocean conditions by climatologists {Schwing and Peterson 2003}. The mechanisms by which climate affects recruitment are not known with certainty; however, strong recruitment years are generally associated with high southward transport in the winter period, low ocean temperatures, and high zooplankton production; these conditions parallel those present in 1999 and the years that immediately followed. Indeed, the connection between productivity and transport has long been recognized {e.g., Chelton et al. 1982}; recent observations are consistent with this finding; for example, Swartzman and Hickey {2003} describe an increase in euphausiid biomass following the 1999 shift in much of the California Current (generally south of Cape Blanco), and Feinberg and Peterson {2003} describe a dramatic increase in the duration and intensity of euphausiid spawning off Oregon between 1996 and 2001.

In that stock assessments estimate spawning biomass of a stock over time, it is reasonable to conclude that the effects of climatological events, such as El Nino and PDO, on groundfish species are accounted for within the analyses. However, with one exception, current stock assessments do not explicitly account for their effect on stock status, such as changes in fishing mortality. Only Schirripa and Colbert {2005; 2006} have integrated relative sea level (a proxy for transport) into the sablefish stock assessment as an environmental factor related to recruitment variability.

Future effects of ocean conditions on the status of affected species, on the other hand, are not encompassed within the analysis of the present action. Most notably, the criteria used to analyze impacts on depleted species, such as the time to rebuild under a constant harvest rate and the probability of successfully rebuilding the stock by T_{max}, do not account explicitly for the effects of climatological events. Indeed, although the development of statistical indices of climate variability across multiple time scales has improved our understanding of how climate has affected North Pacific ecosystems and productivity in the past, the future remains subject to poor predictability. Such uncertainty, with respect how fish productivity and the climate regime interact and with respect what and when short- and long-term climate changes will occur, brings about greater uncertainty surrounding stock assessment projections of future biomass: since predictions about future productivity are based on past relationships, between stock size and recruitment for example, if underlying conditions change, these predictions may under- or over-estimate population growth and sustainable fishery removals. For depleted species in particular, errors in prediction may lead to the need to decrease fishing effort below levels specified in the rebuilding plan in order to achieve a rebuilt stock by the target date. On the other hand, unanticipated increases in recruitment strength may allow for a quicker time to rebuild. In either case, amendments to the stock's rebuilding plan may be necessary. This environmentally-related uncertainty pertains more specifically to some depleted species (such as bocaccio, explained above) rather than to others; for species such as cowcod and widow rockfish, recruitment trends are better explained by the deterministic stock-recruitment relationship that is modeled within a stock assessment.

4.4.2.2 Spatial Effects

Under the current groundfish FMP, most stocks are managed under a coastwide OY. However, there is increasing evidence that for some stocks, a greater consideration of spatial dynamics could be appropriate, particularly with respect to minimizing the potential for localized depletion.

Berkeley et al. {2004} review examples of complex population structure in rockfish populations that suggests that only a small fraction of the spawners in a given stock contribute to successful recruitment. This can be attributed to high temporal and spatial variability in the coastal ocean that provides only limited opportunities for optimal environmental conditions that are required for successful recruitment for those species for which recruitment variability is high. Consequently, there could be increased recruitment variability, or some potential for recruitment failure, if the most reproductively important elements of a stock are depleted below target levels.

Similarly, for stocks with limited genetic exchange, overfishing of isolated population units could be possible where current stock assessments do not take such population structure into account. For example, Miller et al. {2005} found significant genetic differences among black rockfish adults collected 340–460 km apart, despite the assumption that prolonged larval duration led to widespread dispersal and minimal population structure in this species.

The risk to a species of reduced reproductive success or the depletion of genetic sub-populations is likely to increase with higher levels of fishing mortality. Alternative 3, therefore, poses the greatest risk of adverse spatial effects to depleted species, while Alternative 1 poses the least risk. In addition, alternative management measures may contribute to adverse spatial effects for a given species, as these could change the spatial and/or temporal concentration of catch (at a local and a coastwide scale) from that observed under current conditions. In all alternatives, however, the low OYs for depleted species constrain the catch of many healthy stocks to levels below their OYs, bringing about a reduction in the risk of adverse spatial effects for healthy stocks.

Many Pacific groundfish harvest specifications are structured following biogeographic zones (such as north-south divisions at Cape Mendocino and at Point Conception; see section 3.1.3 for more information). However there is not yet the science available to support spatial management at the resolution that may be necessary to reduce the risks discussed above; data limitations for stock assessment models preclude such advancement for most, if not all, West Coast groundfish species in the near term. Pelletier and Mahevas {2005} compiled a comprehensive review of fisheries and marine ecosystem simulation models and approaches that incorporated spatial dynamics, and rated the potential for each approach to address a range of ecological and fisheries related effects described as important elements of the success (or lack thereof) of implementing spatial management measures. These included restoring spawning biomass within closed areas, restoring demographic structure, increasing fecundity, enhancing fisheries yield, improving population stability and resilience, protecting biodiversity, and effecting changes in community structure. Such issues will be integral elements of fisheries science and management in the future, and advances in both assessment methods and simulation techniques should provide the means to better cope with the challenges of incorporating such complexity in the face of changing management regimes.

4.5 Summary of Impacts

4.5.1 Documentation of Impact Analysis Modeling

4.5.1.1 Modeling Limited Entry Trawl Impacts

Fleet-wide discard estimates associated with groundfish trawling are derived from WCGOP observer data and logbook and fish ticket data obtained from the Pacific Fisheries Information Network (PacFIN). Observer data are stratified by area, depth, and season. The management line at 40°10' N latitude is used to partition northern and southern areas. Bi-monthly cumulative limit periods are combined to form two seasons, representing winter (January-April and November-December) and summer (May-October). The northern area includes five depth strata, however, only four are used in the south, due to the paucity of observed trips in depths shallower than 100 fm. The number of observed tows and retained catch of target species within each stratum are reported in Table 4-15 for the 2004 fishery. For this analysis, target species include all flatfish, sablefish, and thornyheads, and also slope rockfish in the area south of 40°10' N latitude. Since regulations severely limit or eliminate the retention of rebuilding species, estimating fleet discard for those species by applying a ratio of discarded-to-landed catch to landings is not reliable. Consequently for rebuilding or bycatch species, retained target-species catch is used as a measure of effort for expanding discard from observed trips. Table 4-16 shows aggregate discard ratios for several species in each stratum. For bycatch species (upper panel), the discard ratios represent the discarded poundage for each species divided by the retained target species poundage. For target species (lower panel), the ratio of discarded-to-retained pounds is presented for each species.

Logbook data are then stratified in the same manner as observer data, and the retained amounts of individual target species are aggregated for each stratum (Table 4-17). For each target species, an initial estimate of discard is calculated by multiplying the retained poundage by the appropriate discard ratio reported in Table 4-15. For bycatch species, estimated discard is calculated by multiplying aggregate target species poundage in each stratum by the corresponding discard ratio. Logbook data do not include records for all trawl trips, and for purposes of this analysis, records without recorded depth or latitude-longitude coordinates are not included. To adjust for these factors, the discard amounts are expanded to reflect the difference in landed catch reported in fish tickets and logbooks. For target species, the expansion ratio is equal to fish ticket pounds for each species divided by the logbook pounds for each state and 2-month period. For bycatch species, the ratio of fish ticket-to-logbook poundage for combined target species is used.

Table 4-15. Number of limited entry trawl tows and retained target species poundage observed by the West Coast Groundfish Observer Program in 2004, by depth interval, area and season.

Area	Depth intervals (fm)	Winter [a/] Number of observed tows	target species [b/] retained (lbs)	Summer [a/] Number of observed tows	target species [b/] retained (lbs)
North of 40°10'					
	0-50	143	169,783	483	533,043
	51-75	164	158,449	496	646,807
	151-200	177	724,372	161	653,321
	201-300	508	2,330,542	288	1,007,533
	>300	198	709,423	170	503,181
South of 40°10'					
	0-100	47	21,858	118	153,556
	151-200	55	95,158	47	138,165
	201-300	101	398,342	119	492,927
	>300	178	676,715	104	338,339

a/ Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5.

b/ Target species are defined as all flatfish, sablefish and thornyheads in both areas and also slope rockfish in the southern area.

Table 4-16. Discard ratios for major West Coast bycatch and target species for 2004, by area and depth interval in trawl tows observed during 2004, by the West Coast Groundfish Observer Program.

	North of 40°10' Depth intervals (fm)						South of 40°10' Depth intervals (fm)				
	0-50	51-75	151-200	201-300	>300	All depths	0-100	151-200	201-300	>300	All depths
Rebuilding species											
(Ratio of species pounds discarded to total target species pounds retained)											
Lingcod	0.03356	0.04852	0.01048	0.00070	0	0.00971	0.04622	0.04403	0.00044	0	0.00807
Canary	0.00379	0.00459	0.00024	0	0	0.00078	0.00419	0	0	0	0.00031
Widow	0.00033	0.00186	0.00107	0	0	0.00040	0.00007	0.00124	0	0	0.00013
Yelloweye	0.00030	0.00006	0.00003	0	0	0.00003	0.00009	0.00000	0	0	0.00001
Bocaccio							0.01146	0.00305	0.00001	0	0.00117
Cowcod							0.00133	0.00001	0	0	0.00010
POP	0.00001	0.00027	0.03374	0.00662	0.00097	0.00983					
Darkblotched	0.00536	0.00251	0.04163	0.01414	0.00534	0.01576	0.00000	0.02385	0.00051	0.00001	0.00261
Target Species											
(Ratio of each species' discarded-to-retained pounds)											
Sablefish	0.134	0.154	0.485	0.379	0.196	0.310	0.412	0.691	0.239	0.187	0.241
Shortspine	0	0.006	0.770	0.302	0.250	0.331	0	0.786	0.350	0.319	0.328
Longspine	0	0	0.679	0.644	0.154	0.212	0	0.078	0.290	0.143	0.153
Dover	0.229	0.069	0.044	0.015	0.085	0.037	2.093	0.315	0.050	0.136	0.099
Petrale sole	0.087	0.095	0.003	0.003	0.346	0.031	0.063	0.015	0.001	0.010	0.037
English sole	0.254	0.184	0.020	0.007	0.019	0.160	0.784	0.590	0.167	0	0.669
Arrowtooth	1.271	2.868	0.073	0.078	0.084	0.247	1.983	15.936	4.879	18.246	6.043
Other Flatfish	0.174	0.386	0.120	0.068	0.566	0.181	0.070	0.825	0.155	2.948	0.160
Slope Rock.	0.002	0.191	0.314	0.228	0.059	0.259	34.632	0.287	0.080	0.026	0.189
Yellowtail	0.535	0.130	312.866	12.890	0	0.314					
Chilipepper							24.191	0.883	0.017	0.000	3.549

Table 4-17. Number of limited entry trawl tows and retained target species poundage reported in West Coast groundfish trawl logbooks for 2004.

Area	Depth intervals (fm)	Winter [a/] Number of tows	Winter [a/] target species [b/] retained (mt)	Summer [a/] Number of tows	Summer [a/] target species [b/] retained (mt)
North of 40°10'	0-50	446	120	2,854	1,134
	51-75	383	122	2,852	2,511
	151-200	744	1,083	840	1,181
	201-300	1,540	2,899	977	1,414
	>300	568	921	498	683
South of 40°10'	0-100	1,821	90	2,056	146
	151-200	166	120	255	220
	201-300	303	410	436	697
	>300	412	616	398	672

a/ Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5.

b/ Target species are defined as all flatfish, sablefish and thornyheads in both areas and also slope rockfish in the southern area.

4.5.1.2 Modeling Limited Entry Fixed Gear Impacts

Two major strategies for the limited entry fixed gear fleet are targeting of nearshore groundfish species and targeting sablefish in both the primary fishery and the daily-trip-limit (DTL) fishery. Nearshore impact modeling methodology is described in section 4.5.1.4. Impacts in the sablefish targeting strategies are modeled as follows.

Fleet-wide discard estimates associated with fixed-gear sablefish fishing are derived from WCGOP observer data and fish ticket data obtained from PacFIN . WCGOP observation of fixed-gear vessels targeting sablefish began in 2001 and has focused on those participating in the limited-entry primary fishery. Due to the limited numbers of trips observed south of 40°10' N latitude, discard ratios are calculated through pooling all observations for 2004 within each gear group (longline and pot). Few vessels (limited entry or open access) were observed while fishing for sablefish under the "daily-trip-limit" provisions. However, in this analysis, observations from the primary fishery are assumed to be representative of bycatch and discard occurrences associated with all fixed-gear sablefish fishing north of 36° N latitude. Because there are no logbook data indicating the depth of fishing, it is not possible to apply the same depth-stratified approach used for the trawl fleet. Consequently, the coast-wide observer data are summarized, by gear, across the two depth zones where the fishery was permitted to take place in 2004: greater than 100 fm, north of 40°10' N latitude, and greater than 150 fm, south of 40°10' N latitude. As presented in Table 4-18, discarded amounts of sablefish are calculated for each gear and area, using fish ticket landings and the corresponding discard ratios. Since only a fraction of discards die, an assumed mortality percentage is applied. In accordance with the rate of survival assumed by the GMT, 20% of the discarded poundage is assumed to represent mortality. For rebuilding species, observed discard ratios relative to retained sablefish, are then used to calculate estimated amounts of mortality for each.

Table 4-18. Estimated discard of rebuilding species and sablefish associated with all fixed-gear sablefish landings north of 36° N latitude during 2004.

	South of 40°10' (seaward boundary of the RCA at 150 fm)			North of 40°10' (seaward boundary of the RCA at 100 fm)			Summary for area north of 36° N. Lat.
	Gear rates and discard		Combined discard	Gear rates and discard		Combined discard	
	Longline	Pot		Longline	Pot		
Sablefish							
Sets observed in each area and depth range							
number of sets	20	43		248	90		
observed sablefish catch	24,125	129,344		254,304	128,900		
Observed sets used for discard ratios in each depth range							
number of sets	146	127		268	133		
observed sablefish catch	146,045	257,357		278,430	258,243		
Total landings (mt)	**294**	**159**		**1,140**	**521**		**2,113**
Area percent, by gear	65%	35%		69%	31%		
Coast-wide percent, by gear/area	14%	8%		54%	25%		
Observed sablefish discard ratio	9.8%	42.2%		11.5%	42.1%		21.1%
Total estimated discard	29	67		131	219		446
Estimated discard mortality[a/] (mt)	6	13		26	44		89
Estimated total mortality	**300**	**172**		**1,166**	**564**		**2,203**
Rebuilding species discard ratios [b/]							
Lingcod	0.018%	0.273%		0.144%	0.284%		
Canary rockfish	0.016%	0%		0.101%	0%		
Widow rockfish	0%	0%		0%	0%		
Yelloweye rockfish	0.023%	0%		0.089%	0%		
Bocaccio rockfish [c/]	0%	0%		0%	0%		
Cowcod rockfish [c/]	0%	0%		0%	0%		
Pacific ocean perch	0%	0%		0.002%	0.002%		
Darkblotched rockfish	0.042%	0.009%		0.029%	0.009%		
Estimated rebuilding species discard (mt)							
Lingcod	0.1	0.4	**0.5**	1.6	1.5	3.1	**3.6**
Canary rockfish	0.0	0.0	**0.0**	1.1	0.0	1.1	**1.2**
Widow rockfish	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Yelloweye rockfish	0.1	0.0	**0.1**	1.0	0.0	1.0	**1.1**
Bocaccio rockfish [c/]	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Cowcod rockfish [c/]	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Pacific ocean perch	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Darkblotched rockfish	0.1	0.0	**0.1**	0.3	0.0	0.4	**0.5**

a/ As assumed by the Groundfish Management Team, the rate of mortality for discarded sablefish in the fixed gear fishery is assumed to be 20%.

b/ Discard ratios are calculated by dividing the total discarded weight of each species by the retained catch weight of sablefish, and are derived from data collected by the West Coast Groundfish Observer Program during the 2004 limited entry fixed gear primary fishery.

c/ Please note that the observer data include few observations from south of Ft. Bragg, CA, so these rates may underestimate the true bycatch of these species.

4.5.1.3 Modeling Open Access Impacts

Open access impacts are modeled using the limited entry fixed gear sablefish impact methodology described in the previous section for the directed open access strategies targeting sablefish (i.e., the daily-trip-limit fishery). Modeling impacts for that portion of the open access fishery targeting nearshore groundfish species is described in the following section.

4.5.1.4 Modeling Nearshore Commercial Impacts

Fleet-wide discard estimates associated with near-shore groundfish fishing are derived from observer data, fish ticket data obtained from PacFIN, and other parameters developed by the GMT. WCGOP began pilot coverage of vessels targeting near-shore rockfish and associated species, such as cabezon and kelp greenling, in 2003. Data collected from these vessels from January 2003 through August 2004 were summarized in a report published on the NWFSC web site in May of 2005 (http://www.nwfsc.noaa.gov/research/divisions/fram/observer/datareport/nearshore/datareport_nearshore_may2005.cfm). Data from the remainder of 2004 have not yet been released. It should be noted that the coverage of observed trips and tonnage reported in Table 4-19 reflect lower levels of coverage than for other fleets, and in turn greater uncertainty in estimating discard relationships. Table 4-20 summarizes bycatch ratios for rebuilding species and the number of observed gear sets used to calculate them. Table 4-21 summarizes the observed catch weight of target and rebuilding species, and the percentage of each species or species-group's catch that was discarded.

Table 4-19. Number of observed open access, fixed gear trips occurring at less than 50 fm and associated landed tonnage, by port group and gear from January 1, 2003 to August 31, 2004.

Port Group	Hook and Line [a/]		Pot [a/]	
	Number of trips	Landed catch (mt)	Number of trips	Landed catch (mt)
Astoria	16	1.2	b/	
S Oregon	71	7.3		
Crescent City	114	14.6		
Fort Bragg	12	0.3	10	0.3
Monterey	24	1.2		
Morro Bay	77	3.9	12	2.5
Santa Barbara	15	0.6	15	1.8
Los Angeles	31	0.7	32	3.2
ALL PORTS	360	29.7	b/	

a/ Since both gear groups were used on some trips, the total number of observed trips is less than the sum of the numbers shown for each gear group in this table.

b/ Data not reported because of confidentiality issues.

Table 4-20. Ratios of bycatch, for eight[a/] rebuilding species, per 100 pounds of retained nearshore target species, by area and depth, from open access fixed gear sets observed between January 1, 2003 and August 31, 2004 by the West Coast Groundfish Observer Program.

	0 - 10 fm	11 - 20 fm	21 - 50 fm
North of 40°10'			
Number of applicable observed sets	152	173	19
Species catch per 100 lb of retained nearshore species			
Canary Rockfish	0.413	1.646	5.344
Lingcod	27.593	36.700	73.092
Widow Rockfish	0.024	0.021	0.173
Yelloweye Rockfish	0.142	1.109	9.404
South of 40°10'			
Number of applicable observed sets	254	68	
Species catch per 100 lb of retained nearshore species			
Canary Rockfish	0.012	1.756	Insufficient data
Lingcod	23.936	33.773	
Widow Rockfish	0	0	
Yelloweye Rockfish	0	0	

a/ No bycatch of bocaccio, cowcod, darkblotched rockfish or Pacific ocean perch were observed in these sets.

Table 4-21. Discard percentages for target and rebuilding species, by area and depth, from open access fixed gear sets observed between January 1, 2003 and August 31, 2004 by the West Coast Groundfish Observer Program.

	0 - 10 fm	11 - 20 fm		21 - 50fm	All Depths		
Area / Species	Total lbs	Discard % [a/]	Total lbs	Discard % [a/]	Total lbs	Discard % [a/]	Total lbs	Discard % [a/]
North of 40°10'								
Target species								
Black Rockfish	15,193	2%	16,189	1%	744	0%	32,125	1%
Blue Rockfish	912	16%	2,431	12%	182	14%	3,525	14%
Other minor nearshore rockfish	601	6%	1,530	5%	1,043	2%	3,175	4%
Cabezon	1,471	21%	2,467	21%	184	20%	4,122	21%
Kelp Greenling	988	23%	1,570	18%	83	14%	2,641	20%
Rebuilding species								
Canary Rockfish	66	100%	308	99%	85	100%	458	100%
Widow Rockfish	4		4		3		11	
Yelloweye Rockfish	23	100%	207	100%	150	100%	379	100%
Lingcod [b/]	4,408	43%	6,860	40%	1,164	15%	12,431	39%
South of 40°10'								
Target species								
Shallow nearshore species	4,347	24%	943	52%	54	40%	5,344	29%
Deeper nearshore species	1,920	18%	2,234	13%	27	100%	4,181	16%
Kelp Greenling	1,588	62%	19	87%	10	100%	1,617	62%
Cabezon	10,864	29%	263	72%	33	100%	11,160	30%
California Sheephead	13,199	36%	2,702	35%	239	15%	16,141	35%
Rebuilding species								
Bocaccio Rockfish					27	8%	27	8%
Canary Rockfish	2	100%	63	100%	6	100%	72	100%
Lingcod [b/]	4,422	42%	1,258	56%	24	56%	5,704	45%

a/ The percentage discarded is calculated as the discard poundage divided by the total catch weight for each species.

b/ Lingcod was declared rebuilt in 2005.

In May 2005, the values presented in Tables 4-20 and 4-21 were used by the GMT, in conjunction with other information provided by Team members, in constructing the framework for evaluating discard in the nearshore fisheries presented in Tables 4-22 and 4-23. For the purposes of estimating 2004 discard in nearshore groundfish fisheries, the framework and parameters developed by the GMT have not been updated, except for the target species landed catch amounts. However, an overview of the process embodied in these two tables is presented below for purposes of clarity. Table 4-22 summarizes the calculation of discard for target species. Landed weights for each species/group are expanded to total catch estimates, using all-depth retention rates. Using observer and state-agency information, total catch is then distributed among 3 depth intervals: 0-10 fm, 11-20 fm, and 21-50 fm. Within each of those strata, depth-specific gross discard and mortality estimates are calculated using observed discard ratios and assumed rates of discard survival. The estimated retained catch of all target species within each area/depth stratum is used with observer-derived discard ratios to estimate the discard mortality of rebuilding species in these fisheries (Table 4-23).

Table 4-22. Estimated nearshore target species discard mortality, derived using the Groundfish Management Team nearshore model with 2004 landed catches.[a]

Area	All depths			0 - 10 fm							11 - 20 fm						
	landed catch (mt)	retention rate	total catch (mt)	% of total catch	stratum catch	gross discard		discard mortality		stratum mortality	% of total catch	stratum catch	gross discard		discard mortality		stratum mortality
Species					mt	%	mt	%	mt	mt		mt	%	mt	%	mt	mt
South of 40°10'																	
Shallow nearshore species	**42**	71%	59	81%	48	24%	12	15%	1.7	38	18%	10	52%	5	45%	2.4	7
Deeper nearshore species	**46**	84%	55	43%	24	17%	4	10%	0.4	20	53%	29	13%	4	40%	1.5	27
Cabezon	**47**	70%	67	97%	65	29%	19	7%	1.3	48	2%	2	72%	1	7%	0.1	1
Kelp Greenling	**2**	38%	5	98%	5	62%	3	7%	0.2	2	1%	0	87%	0	7%	0.0	0
All nearshore groundfish	**137**	74%	184	77%	142	26%	37	10%	3.7	108	23%	41	25%	10	39%	4.0	35
North of 40°10'																	
Black Rockfish	**180**	99%	183	47%	87	2%	2	10%	0.2	85	50%	92	1%	1	40%	0.4	92
Blue Rockfish	**12**	86%	13	26%	3	16%	1	10%	0.1	3	69%	9	12%	1	40%	0.4	9
Other minor nearshore rockfish	**39**	96%	41	55%	22	6%	1	20%	0.3	21	35%	14	5%	1	50%	0.4	14
Cabezon	**30**	79%	38	36%	14	21%	3	7%	0.2	11	60%	23	21%	5	7%	0.3	19
Kelp Greenling	**24**	80%	29	37%	11	23%	3	7%	0.2	9	59%	17	18%	3	7%	0.2	15
All nearshore groundfish	**285**	94%	303	45%	137	7%	9	10%	0.9	129	52%	156	7%	11	16%	1.7	147

Table 4-22. Estimated nearshore target species discard mortality, derived using the Groundfish Management Team nearshore model with 2004 landed catches (continued).[a/]

Area / Species	21 - 50 fm							0 - 50 fm			
	% of total catch	stratum catch	gross discard		discard mortality		stratum mortality	mortality from:			discard as a percentage of mortality
		mt	%	mt	%	mt	mt	landings (mt)	discard (mt)	total (mt)	
South of 40°10'											
Shallow nearshore species	1%	1	60%	0.4	100%	0.4	1	42	4.5	46.3	9.8%
Deeper nearshore species	4%	2	60%	1.3	100%	1.3	2	46	3.2	49.5	6.5%
Cabezon	0%	0	75%	0.1	7%	0.0	0	47	1.4	48.3	2.9%
Kelp Greenling	1%	0	90%	0.0	7%	0.0	0	2	0.2	2.0	10.4%
All nearshore groundfish	2%	3	61%	1.9	91%	1.7	3	137	9.4	146.1	6.4%
North of 40°10'											
Black Rockfish	2%	4	0%	0.0	100%	0.0	4	180	0.5	180.9	0.3%
Blue Rockfish	5%	1	14%	0.1	100%	0.1	1	12	0.6	12.2	4.9%
Other minor nearshore rockfish	10%	4	2%	0.1	100%	0.1	4	39	0.7	39.7	1.8%
Cabezon	4%	2	20%	0.3	7%	0.0	1	30	0.6	31.0	1.8%
Kelp Greenling	3%	1	14%	0.1	7%	0.0	1	24	0.4	23.9	1.7%
All nearshore groundfish	4%	12	6%	0.7	33%	0.2	11	285	2.8	287.7	1.0%

a/ The model uses discard and retention percentages reported by the West Coast Groundfish Observer Program from data collected between January 1, 2003 and August 31, 2004.

Table 4-23. Groundfish Management Team nearshore model for estimating target species' discard mortality, with 2004 landed catches.

	0 - 10 fm	11 - 20 fm	21 - 50 fm	Estimated bycatch (mt)			
				0 - 10 fm	11 - 20 fm	21 - 50 fm	0 - 50 fm
South of 40°10'							
Retained nearshore mt	104	31	1.2				
Rebuilding species		*Bycatch rates*					
Canary	0.01%	1.76%	1.76%	0.01	0.55	0.02	0.58
disc. mort. (%:mt)	10%	55%	100%	0.00	0.30	0.02	**0.32**
Lingcod							
catch (%:mt)	23.40%	33.77%	33.77%	24.44	10.49	0.40	35.33
landed (%:mt)	58%	44%	55%	14.18	4.62	0.22	19.01
discard (%:mt)	42%	56%	45%	10.27	5.88	0.18	16.32
disc. mort. (%:mt)	7%	7%	7%	0.72	0.41	0.01	1.14
total mortality				14.89	5.03	0.23	**20.15**
North of 40°10'							
Retained nearshore mt	128	145	11				
Rebuilding species		*Bycatch rates*					
Canary	0.41%	1.65%	5.34%	0.53	2.39	0.59	3.51
disc. mort. (%:mt)	10%	55%	100%	0.05	1.32	0.59	**1.96**
Widow	0.02%	0.02%	0.17%	0.03	0.03	0.02	**0.08**
Yelloweye	0.14%	1.11%	9.40%	0.18	1.61	1.03	2.83
disc. mort. (%:mt)	50%	90%	100%	0.09	1.45	1.03	**2.58**
Lingcod							
catch (%:mt)	27.59%	36.70%	73.09%	35.34	53.40	8.03	96.76
landed (%:mt)	57%	60%	85%	20.14	32.04	6.83	59.00
discard (%:mt)	43%	40%	15%	15.19	21.36	1.20	37.76
disc. mort. (%:mt)	7%	7%	7%	1.06	1.50	0.08	2.64
total mortality				21.21	33.53	6.91	**61.65**
Estimated coast-wide discard mortality associated with near-shore groundfish targets							
					Canary		**2.28**
					Widow		**0.08**
					Yelloweye		**2.58**
					Lingcod		**3.79**

4.5.1.5 Modeling Tribal Fishery Impacts

Background

From 1991 to 2002, Makah fishermen have employed trawl gear on a limited, exploratory basis. Recently, trawl fisheries have been developed to diversify harvest strategies and maximize fisheries production (vessels must choose between trawling and longlining and cannot engage in both). The trawl fleet had eight vessels in 2003 and expanded to the current fleet limit of 10 vessels in 2004. They pursue two basic strategies – bottom (small footrope) and midwater (pelagic) trawl. The majority of the fleet participates in both strategies though some specialize in one or the other. The bottom trawl fishery targets flatfish (primarily Dover, English, and petrale soles and arrowtooth flounder) and Pacific cod, while the midwater fishery targets yellowtail rockfish. In an agreement with the National Marine Fisheries Service and the Pacific Fishery Management Council, the Makah Tribe implemented an observer program in 2003 to monitor maximum retention compliance in the newly developed trawl fisheries. The observer program has a monthly (and overall annual) sampling rate target of 15% of all trips and is administered by a cooperative agreement between the Makah Tribe, Northwest Indian Fisheries Commission, and Washington Department of Fish and Wildlife.

Current Management

Makah Fisheries Management has developed trip limits for the trawl fleet for each of two strategies – bottom and midwater – that maximize production, while discouraging both interactions with overfished species and conflicts (i.e., preempting another fleet's opportunity) with their groundfish directed longline fleet (Tables 4-24 and 4-25). While trip limits are in place to discourage targeting on several species, especially overfished rockfishes (e.g., canary), maximum retention is required. Maximum retention in this case is defined as full retention of all marketable species, with particular emphasis on canary and widow rockfishes. Any trip limit overages are sold and the proceeds forfeited to the Tribe.

Table 4-24. Trip limits for the tribal midwater trawl fishery for both 2003 and 2004.

SPECIES	TRIP LIMITS
Yellowtail rockfish	≤ 30,000 lbs/trip
Widow rockfish	≤ 10% of yellowtail
Canary rockfish	300 lbs/trip
Minor shelf rockfish	300 lbs/trip
Minor slope rockfish	300 lbs/trip
Minor nearshore rockfish	300 lbs/trip
Thornyheads (long- and shortspine combined)	300 lbs/trip
Other species	Same as initial Limited Entry (LE) trawl N of 40° 10'

Table 4-25. Trip and/or cumulative limits for the tribal bottom trawl fishery for 2003 and 2004.

SPECIES	2003 LIMITS	2004 LIMITS
Petrale sole	30,000 lbs/2 mo	30,000 lbs/2 mo
Arrowtooth flounder	60,000 lbs/2 mo	30,000 lbs/trip
All other flatfish	100,000 lbs/2 mo	100,000 lbs/2 mo
Lingcod	300 lbs/day (not to exceed 900 lbs/week)	450 lbs/day (not to exceed 1,350 lbs/wk)
Sablefish	6,000 lbs/yr dressed wt	6,000 lbs/yr dressed wt
Yellowtail rockfish	5,000 lbs/mo	3,000 lbs/trip
Widow rockfish	$\leq$ 10% of yellowtail/trip	$\leq$ 10% of yellowtail/trip
Canary rockfish	300 lbs/trip	300 lbs/trip
Minor shelf rockfish	300 lbs/trip	300 lbs/trip
Minor slope rockfish	300 lbs/trip	300 lbs/trip
Minor nearshore rockfish	300 lbs/trip	300 lbs/trip
Thornyheads (long- and shortspine combined)	300 lbs/trip	300 lbs/trip
Other species	Same as initial LE trawl N of 40° 10'	Same as initial LE trawl N of 40° 10'

Since canary rockfish is the primary constraint in both strategies, management centers on its avoidance. The two strategies may be open simultaneously (though most fishermen with midwater nets will prosecute that strategy when available) and are closed whenever bycatch rates appear elevated. The bottom trawl fishery has a small footrope requirement ($\leq$ 8 inches) that reduces rockfish interactions by preventing access to reefs, rocky substrate, and other high-relief areas. The midwater fishery uses pelagic nets and is managed with a combination of time and area closures to minimize impacts on canary and widow rockfishes.

Midwater trawl areas are defined by latitudinal and longitudinal coordinates in regulations. An area is opened after two vessels with full observer coverage make exploratory trips to verify that bycatch rates are low enough to prosecute the fishery. An area is closed whenever bycatch rates appear elevated. The fishery is also closed June-August based on anecdotal evidence from fishermen that canary rockfish bycatch is highest in these months. Trip limits are usually 30,000 pounds/2 month period, but may be adjusted upwards to a maximum of 30,000 pounds/trip if bycatch appears minimal and few vessels are participating.

Methods

Observations are conducted by the port sampler operating out of Neah Bay, WA. Vessels must contact an observer hotline 24 hours prior to departure stating the date and time of departure and expected duration of the trip. Vessels are selected in a quasi-random manner based on availability of the observer in coordination with his other duties (i.e., dockside sampling and data entry). Data collected include gear type, tow duration, average depth, start and end location, and pounds discarded and retained. Priority is given, in decreasing order, to verifying maximum retention, quantifying discard of halibut and their disposition (not covered in this report), and quantifying all other discard species.

Bycatch rates were measured as total catch (retained + discard, if any) of bycatch species divided by landed catch of target species in pounds – similar to the method employed by the West Coast Groundfish Observer Program. While tow-by-tow data are collected by the observer, corresponding information is not available for unobserved trips making it difficult to attribute bycatch to a particular bottom trawl target strategy. Instead, bycatch rates for bottom trawl are reported for primary flatfish targets combined (petrale, English, and Dover soles and arrowtooth flounder), all flatfish combined, Pacific cod, and all targets combined (i.e., Pacific cod plus all flatfish). Target species are divided into these categories to help determine if bycatch of canary can more readily be attributed to flatfish fishing or Pacific cod fishing. The midwater trawl fishery targets only yellowtail rockfish. Bycatch of canary rockfish is measured for both bottom and midwater trawl fisheries. Bycatch of widow rockfish in midwater trawl is also examined.

Comparisons of observed versus unobserved landings by year were conducted for each strategy to test for differences in retention of select overfished species. Separate analyses were performed for vessels that carried an observer (paired *t* test) and all vessels combined (i.e. including those vessels that had no observer coverage during the year). For all vessels combined the assumption of equal variance was tested and the appropriate *t* test performed. Comparisons of canary rockfish associated with primary flatfish, Pacific cod, and all target species combined were conducted for bottom trawl. Comparisons based on all flatfish landings were not performed, since other flatfish (i.e., non-primary species) are not specifically targeted and change bycatch rates very little. Both widow and canary rockfish associated with yellowtail rockfish were examined for midwater trawl. Comparisons across years were not performed to avoid confusion of interannual variation in species availability or targeting strategy with fishing behavior associated with carrying an observer.

Results

Bottom Trawl

In 2003 there were 23 sampled trips out of 175 total trips (13.1%). Coincidentally, 23 of 221 total trips (10.4%) were also sampled in 2004. Discard in both years consisted primarily of Pacific whiting, spiny dogfish, unmarketable flatfish, and other unmarketable fishes (Table 4-26). Bycatch rates for all landings by target and year are provided in Table 4-27.

Table 4-26. Observed tribal bottom trawl discard in pounds by species or species group by year.

Species	2003	2004
Pacific whiting	11,000	5,097
Spiny dogfish	9,534	9,231
Arrowtooth flounder	1,982	6,250
Unspecified skates	1,485	4,723
Unspecified sole	1,219	1,484
Ratfish	1,180	3,361
Pollock	120	503
Minor shelf rockfish	30	104

Table 4-27. Total fleet bycatch rates (measured as pounds of canary rockfish in the tribal bottom trawl fishery divided by pounds of target category) by year.

Target	2003	2004
Primary flatfish	0.00138	0.00223
All flatfish	0.00131	0.00212
Pacific cod	0.00137	0.00249
All targets	0.00067	0.00115

Two-tailed paired t tests found no significant difference between observed and unobserved trips for vessels that carried an observer during the season for either year (Table 4-28). Canary catches per combined primary flatfish landings were not significantly different. Similarly, canary catches associated with Pacific cod and all targets combined were not significantly different.

Table 4-28. Yearly comparisons of canary rockfish bycatch rates (measured as pounds of canary rockfish divided by pounds of target category) for tribal bottom trawl vessels that carried an observer at least once during a season.

Year	Target Species	Mean Bycatch Rates		d.f.	t	p
		Observed	Unobserved			
2003	Primary flatfish	0.00121	0.00198	6	0.79	0.46
	Pacific cod	0.00202	0.00344	6	-0.60	0.57
	All Targets	0.00059	0.00113	6	-0.89	0.41
2004	Primary flatfish	0.00772	0.00343	5	0.79	0.47
	Pacific cod	0.03807	0.00312	5	1.19	0.29
	All Targets	0.00619	0.00127	5	1.15	0.30

Two-tailed t tests also found no significant difference between all observed and unobserved trips in either year (Table 4-29). Canary bycatch rates associated with primary flatfish were not significantly different. For Pacific cod, observed versus unobserved trips in 2004 had unequal variances $F\ (5, 9) = 23.62$, $p < 0.01$ and were not significantly different in either year. Bycatch rates of canary for all targets combined also were not significantly different.

Table 4-29. Yearly comparisons of canary rockfish bycatch rates (measured as pounds of canary rockfish divided by pounds of target category) for all observed and unobserved tribal bottom trawl vessels.

Year	Target Species	Mean Bycatch Rates		d.f.	t	p
		Observed	Unobserved			
2003	Primary flatfish	0.00106	0.00143	16	-0.43	0.67
	Pacific cod	0.00176	0.00245	16	-0.38	0.71
	All Targets	0.00052	0.00085	16	-0.68	0.50
2004	Primary flatfish	0.00772	0.00750	14	0.03	0.98
	Pacific cod	0.03807	0.00663	5	1.07	0.33
	All Targets	0.00619	0.00330	14	0.64	0.53

Midwater Trawl

The observer sampled 5 out of 34 trips (16.0%) in 2003, and 11 of 53 trips (20.8%) in 2004. Discard consisted of Pacific whiting, minor shelf rockfish, minor slope rockfish, and dogfish (Table 4-30). Bycatch rates of widow and canary in all landings are provided in Table 4-31.

Table 4-30. Observed tribal midwater trawl discard in pounds by species or species group by year.

Species	2003	2004
Pacific whiting	3270	0
Minor shelf rockfish	450	1175
Minor slope rockfish	63	575
Spiny dogfish	0	70

Table 4-31. Total fleet bycatch rates (measured as pounds of canary or widow rockfish divided by pounds of yellowtail rockfish) in the tribal midwater trawl fishery by year.

Species	2003	2004
Canary	0.00168	0.00350
Widow	0.04263	0.06767

Two-tailed paired *t* tests found no significant difference in bycatch between observed and unobserved trips on vessels that carried an observer at some point in the season (Table 4-32). In 2003 there was no significant difference for canary or widow. There was also no significant difference in 2004 for either canary or widow.

Table 4-32. Yearly comparisons of canary and widow rockfish bycatch rates (measured as pounds of bycatch divided by pounds of yellowtail) for tribal midwater trawl vessels that carried an observer at least once during a season.

Year	Species	Mean Bycatch Rates		d.f.	*t*	*p*
		Observed	Unobserved			
2003	Canary	0.00351	0.00289	2	0.27	0.81
	Widow	0.05353	0.03335	2	0.60	0.61
2004	Canary	0.00651	0.00213	5	1.81	0.13
	Widow	0.07209	0.06719	2	0.30	0.78

In comparisons of all observed versus unobserved trips, two-tailed *t* tests detected no significant differences in bycatch (Table 4-33). Variances for canary bycatch were unequal in observed and unobserved trips for 2003 and 2004 $F(2, 7) = 9.57$, $p < 0.01$ and $F(5, 10) = 5.90$, $p < 0.01$ respectively. The difference in canary bycatch was not significantly different in either year, though in 2004 the difference is characterized as being of "borderline" significance. No significant differences were detected for widow bycatch in either year.

Table 4-33. Yearly comparisons of canary and widow rockfish bycatch rates (measured as pounds of bycatch divided by pounds of yellowtail) for all observed and unobserved tribal midwater trawl vessels.

Year	Species	Mean Bycatch Rates		d.f.	*t*	*p*
		Observed	Unobserved			
2003	Canary	0.00351	0.00124	2	0.72	0.55
	Widow	0.05353	0.07671	9	-0.39	0.70
2004	Canary	0.00651	0.00175	6	2.13	0.08*
	Widow	0.07209	0.05421	15	1.16	0.26

* Difference in canary bycatch rates in 2004 was of borderline significance.

Discussion

Bycatch rates for a particular species can vary considerably within a fleet and for a variety of reasons. Annual variations in distribution or abundance can affect encounters, as can effort and the times and areas fished. This is especially true for patchily distributed animals such as canary and widow rockfishes. In both bottom and midwater trawl fisheries the encounter rate of canary was considerably higher in 2004 than in 2003 (71.6% and 108.3% respectively). The bycatch rate of widow rockfish in the midwater fishery was 58.7% higher in 2004. These increases may also reflect expanding effort (though not capacity) within the trawl fleet as a whole. Some level of increasing impacts may be due to what has been termed the "rebuilding paradox." The paradox is that as overfished species rebuild, they are more likely to be encountered by fishermen trying to avoid them. Estimating the relative influence of these factors will require more data collection and further, detailed analyses.

One interesting effect of increased occurrences of canary rockfish in the 2004 midwater fishery was the prosecution of more observed, exploratory trips to determine if bycatch rates were low enough to conduct the fishery in a given area. Observed vessels engaged in exploratory trips can be expected to have higher bycatch rates than unobserved vessels operating in verified low bycatch areas. This is likely what led to the borderline significant low *p*-value for observed versus unobserved that year. Differentiating observed exploratory trips from other observed trips may lead to more comparable observed versus unobserved bycatch rates. Despite large interannual variation of bycatch rates for these two years, the values measured can still inform management. Examination of bycatch rates over many years could detect patterns, and averages across years weighted toward more recent years can mitigate some of the negative effects of the rebuilding paradox on the fishery as well as reflecting changes in fleet behavior (i.e., if more recent years are likely to be more similar to the upcoming season, preseason planning is improved). If preseason planning is based on accurate expectations of bycatch, inseason management (e.g., time and area restrictions) is likely to be more effective at staying within estimated impacts.

Combining maximum or full retention policies with an observer program to verify the accuracy of bycatch accounting can greatly benefit both the fleet and the resource. In other words, if observed bycatch rates are not significantly different than unobserved bycatch rates, managers can be reasonably certain that landings reflect total mortality for overfished species and fishermen can continue to access healthy stocks. This combination can also prove very cost effective where other programs might not be economically feasible (e.g., full observer coverage). With this method, estimates of total removals can be verified, bycatch rate estimates refined, and better preseason and inseason management can be achieved. In this case, the lack of significant differences between bycatch rates in observed versus unobserved trips shows that the maximum retention program is working and landings are a reasonable estimation of actual impacts.

4.5.1.6 Modeling Washington Recreational Impacts

Washington Recreational Fishery Sampling and Catch Estimates

The Washington Ocean Sampling Program (OSP) generates catch and effort estimates for the recreational boat-based groundfish fishery which are provided to Pacific States Marine Fisheries Commission (PSMFC) and incorporated directly into RecFIN. The OSP provides catch in total numbers of fish, and also collects biological information on average fish size, which is provided to RecFIN to enable conversion of numbers of fish to total weight of catch. Boat egress from the Washington coast is essentially limited to four major ports, which enables a sampling approach to strategically address fishing effort from these ports. Effort estimates are generated from exit-entrance counts of boats leaving coastal ports while catch per effort is generated from angler intercepts at the conclusion of their fishing trip. The goal of the program is to provide information to RecFIN on a monthly basis with a one-month delay to allow for inseason estimates. For example, estimates for the month of May would be provided at the end of June. Some specifics of the program are:

Exit/Entrance Count

Boats are counted either leaving the port (4:30 AM - end of the day) or entering the port (approximately 8:00 AM through end of the day) to give a total count of sport boats for the day.

Interview

Boats are encountered systematically as they return to port; anglers are interviewed for target species, number of anglers, area fished, released catch data and depth of fishing (non-fishing trips are recorded as such and included in the effort expansion). The OSP only collects information on released catch and does not collect information on the condition of the released fish. Therefore, released catches must be post-stratified as live or dead based upon an assumed discard mortality rated. Onboard observers are deployed throughout the sampling season primarily to observe hatchery salmon mark rates but also collect rockfish discard information for halibut charter trips.

Examination of Catch

Catch is counted and speciated by the sampler. Salmon are electronically checked for coded wire tags and biodata is collected from other species.

Sampling Rates

Sampling rates vary by port and boat type. Generally, at boat counts less than 30, the goal is 100% coverage. The sampling rate goal decreases as boat counts increase (e.g., at an exit count of 100, sample rate goal is 30%; over 300, sample rate goal is 20%). Overall sampling rates average approximately 50% coastwide through March-October season.

Sampling Schedules

Due to differences in effort patterns, weekdays/weekend days are stratified. Usually, both weekend days and a random 3 of 5 weekdays are sampled.

Personnel

OSP sampling staff include two permanent biologists coordinating data collection, approximately twenty-two port samplers, four on-board observers and one data keypuncher.

Volume of Data

Between 20,000 and 30,000 boat interviews completed per season coastwide.

Data Expansion

Algorithm for expanding sampled days:

$$\frac{\text{Exit Count}}{\text{Total boats sampled}} * P_s \text{ sampled} = P_t$$

where P_s = any parameter (anglers, fish retained, fish released) within a stratum,
and P_t = total of any parameter with stratum for the sample day

Algorithm for expanding for non-sampled days:

$$\text{Total Weekday Catch} = \frac{\Sigma(P_t) \text{ on sampled weekdays}}{\text{number weekdays sampled}} * \text{no. of weekdays in stratum}$$

$$\text{Total Weekend Catch} = \frac{\Sigma(P_t) \text{ on sampled weekend days}}{\text{number weekend days sampled}} * \text{no. weekend days in stratum}$$

Total weekend catch + total weekday catch = total catch in stratum

Notes on Data Expansion:
Salmon and halibut catches are stratified by week; all other species are stratified by month. All expansions are stratified by boat type (charter or private), port, area and target species trip type (e.g., salmon, halibut, groundfish, and albacore).

Washington Recreational Fishery Impact Modeling

Pre-Season Catch Projections

Projected impacts for Washington's recreational fishery are essentially based upon the previous season's harvest estimated by the Ocean Sampling Program (OSP) and incorporated in RecFIN. This is especially true if recreational regulations remain consistent.

However, in 2005, the Washington Department of Fish and Wildlife implemented a depth restriction of 30 fm for a portion of the Washington coast. Since 2002, the OSP program began collecting fishing depth as well as discard information. This information is keypunched and analyzed on an annual basis with respect to depth of catch for species of concern. Beginning in 2006, and carrying through 2007 and 2008, we have modified our pre-season catch projections, based on the use of depth restrictions, by sub-area and fishery. The Washington recreational management measures include prohibiting fishing deeper than 10, 20, or 30 fm (depending upon time and management sub-area); therefore, the depth analysis was re-structured to determine the catch and mortality of discarded fish relative to these depths, as follows:

Canary Rockfish

- Apply 100% mortality rate to canary rockfish caught on all recreational fishing trips targeting Pacific halibut, when there is no depth restriction in place
- Apply 66% mortality rate to canary rockfish on recreational fishing trips targeting species other than Pacific halibut, when there is no depth restriction in place
- When a 20-fm depth restriction is in place, apply a 50% mortality rate to canary rockfish caught on all recreational fishing trips (based on research by Albin and Karpov, 1995).
- When a 10-fm depth restriction is in place, apply a 10% mortality rate to canary rockfish caught on all recreational fishing trips.
- When a 10- or 20-fm depth restriction is in place, there may be a reduced encounter rate of canary rockfish, but this is not included in the model.

Yelloweye Rockfish

- Apply 100% mortality rate to yelloweye rockfish caught on all recreational fishing trips, when there is no depth restriction in place
- When a 20-fm depth restriction is in place, apply a 50% mortality rate to yelloweye rockfish caught on all recreational fishing trips (based on research by Albin and Karpov, 1995).
- When a 20-fm depth restriction is in place, apply an encounter rate reduction of 25% (based on 2005 OSP catch-by-depth data) as yelloweye tend to inhabit deeper depths.
- When a 10-fm depth restriction is in place, apply a 10% mortality rate to yelloweye rockfish caught on all recreational fishing trips.
- When a 10-fm depth restriction is in place, the yelloweye encounter rate is likely reduced from the rate inside 20 fm, but this is not included in the model.

Inseason Catch Projections

Inseason catch projections are based upon the most recent OSP estimates (with a one-month time lag) with subsequent months extrapolated from the pre-season catch projections. This includes producing inseason reports of discard information for prohibited species such as yelloweye and canary. However, it should be noted that the precision of recreational groundfish catch estimates based upon previous seasons will continue to be influenced by factors such as the length and success of salmon and halibut seasons, weather and other unforeseen factors.

4.5.1.7 Modeling Oregon Recreational Impacts

Data Source for Base Model

Modeling of estimated impacts in the 2007-2008 Oregon recreational groundfish fishery was based on recent year estimates of landings and discards. For the ocean boat fishery, the data source was the Oregon Department of Fish and Wildlife's (ODFW) Ocean Recreational Boat Survey (ORBS). For the shore and estuary fishery, the data source was the Marine Recreational Fishery Statistical Survey (MRFSS). Analyzed species include black, blue, brown, canary, china, copper, grass, quillback, vermilion, tiger, widow, and yelloweye rockfishes; as well as kelp and rock greenlings, cabezon and lingcod.

Landings and discards for the ocean boat fishery (in numbers of fish) were initially based on normalized 2004 and 2005 landings and discards because these data most closely reflect regulations expected in 2007-2008 (i.e., bag limits, effort shifts to avoid overfished and harvest capped species, etc.). The 2004 season reflected very good salmon opportunity, while the 2005 season reflected reduced salmon opportunity. As work progressed on the model and the outlook for salmon opportunity in the near future appeared likely to be reduced from recent years it was decided to model estimated 2007-2008 impacts based solely on the 2005 season (reduced salmon opportunity). Groundfish directed effort has been shown to be affected by salmon opportunity (i.e. groundfish directed effort increases when salmon opportunity is poor due to anglers pursuing other species). Concern was expressed that adopting an overly optimistic groundfish season would result in inseason action to slow catch rates, and anglers would rather have regulations relaxed inseason rather than opportunities curtailed. If salmon opportunity improves in 2007-2008, the recreational groundfish opportunity could be expanded inseason.

Landings and discards for the shore and estuary fishery (in weight), largely not affected by management of overfished species, reflect the most recent 5-year average, 1998-2002 as the MRFSS program is designed for trends and not annual accurate estimates of catch. Only annual weights for greenling and cabezon were adjusted to reflect changes in minimum length requirements.

Normalizing 2005 Catch and Angler Trip Data

To facilitate providing maximum flexibility in modeling 2007-2008 management measure alternatives, landings in 2005 were normalized to a 10-fish marine bag limit and a year round season with no offshore closures.

From 2000 through 2002, the rockfish bag limit had been 10 fish per angler per day. Starting in 2003 a 10-fish marine bag limit was implemented that included species other than lingcod, salmon, steelhead, Pacific halibut, sanddab, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine and smelt. In response to an early closure in 2004, the 2005 marine bag limit started at 8 fish on January 1 and was reduced to 5 fish on July 16.

Normalization of the marine bag limit was accomplished by comparing the average catch per angler trip (CPUE) observed in 2005 (8 and 5 fish marine bag limits in place) with comparable periods in 2003-2004 (10 fish marine bag limit). The average reduction in CPUE observed by adjusting the marine bag limit from 10 to 8 fish was 10.9 percent. A 38.2 percent reduction was observed when the marine bag limit was adjusted from 10 to 5 fish. The same methodology was applied to discards per angler trip, as the number discarded for many species for which retention was allowed increased as the marine bag limit was reduced. Canary and yelloweye rockfish impacts were not adjusted, as the data suggested little change to the duration of groundfish trips, resulting in little savings of those two species.

Landings and discards were normalized to reflect a fishery without depth restrictions. In both 2004 and 2005, during the period from June through September the groundfish fishery was closed shoreward of the 40-fathom line. The expected increase in encounter rates for species residing offshore was based on data from 2001 and 2003-2005 at-sea observations on Oregon charter vessels (360 trips were observed). The observer study was not conducted in 2002. The following increased encounter rates were applied to appropriate months when normalizing to an all-depth fishery: canary rockfish = 1.32; yelloweye rockfish = 1.69; lingcod = 1.3; and widow rockfish = 3.57.

Landings and discards were normalized to a year round season. In both 2004 and 2005 regulations were changed inseason (starting in early September in 2004 and mid-October in 2005). Because of the inseason closures in 2004-2005, the 2003 fishery was used as a template for seasonal catch and effort pattern in the groundfish fishery as it was open January through December. Estimated catch for October through December was calculated by applying the monthly temporal pattern observed in 2003 to the normalized January through September 2005 estimates.

The expected average weight of landed fish was based on those observed in the 2005 ocean boat fishery. The expected average weight of discarded fish in the ocean boat fishery was based on at-sea observations in 2003-2005 with attention paid to matching samples with depth closure regulations. Observations indicate that yelloweye rockfish and canary rockfish caught shoreward of the 40 fm line were considerably smaller than the average size of those caught offshore, due to a higher abundance of juveniles nearshore. Due to small sample sizes observed at-sea, the average weight of fish landed in 2003 was used to represent the average weight of yelloweye rockfish caught during periods of no depth restrictions. For widow rockfish and nearshore rockfish other than black rockfish and blue rockfish, again due to small sample sizes (most are retained), a 25 percent reduction from average landed weight was assumed for discards of these species. This was thought to be conservative as the observed average size of discarded black rockfish and blue rockfish were on the order of a 50 percent reduction from average landed weight.

Annual groundfish directed angler effort for the ocean boat fishery is expected to be similar to levels observed in 2005. Effort data was also normalized using the 2003 temporal pattern to estimate groundfish effort during October through December when the nearshore fishery was closed in 2005. Angler effort in shore and estuary areas is assumed to be similar to the base period of 1998-2002. Groundfish angler trips in the shore and estuary fishery are not available, only total angler trips of all trips types. During closures seaward of 40-fm, ocean boat effort and catch were shifted from the offshore closure areas to open nearshore areas. The estimated effort increase in nearshore waters is 5 percent, which reflects the fact that approximately 5% of the total effort in 2001-2003 was in offshore waters. This effort shift was addressed when normalizing the 2005 fishery.

Estimating Discard Mortality in the Oregon Recreational Groundfish Fishery

An approach similar to that used for the commercial open-access nearshore fishery to determine mortality of discarded groundfish was used to develop appropriate discard mortality rates to be applied to the recreational fishery. The approach incorporates at-sea observations of catch by species, stratified by depth, with angler reported discard, and stratum based mortality rates by species.

At-sea observations were conducted on recreational charter vessels off Oregon during 2001, 2003-2005. A total of 360 vessels trips were conducted. Each year the observations were distributed across the state in an effort to represent the relative magnitude of catch by area. The annual goal was to conduct 100 observations, but that goal was not always achieved due to inseason closures. The number of rockfish observed by species or species group, discarded in the nearshore recreational fishery is reported in Table 4-34.

Table 4-34. Count of released fish observed by depth bin (fm) during 2001, and 2003-2005. Canary and yelloweye data from open all depth periods only; black, blue, and other nearshore rockfish data from all

periods. Other nearshore rockfish includes brown, copper, quillback and china rockfishes (no discards of other nearshore rockfish species were observed).

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	> 40 fm	Sample Size
Black rockfish	296	372	18	2	0	0	688
Blue rockfish	183	622	48	5	0	0	858
Other nearshore rockfish	1	8	2	5	0	0	16
Canary rockfish	13	107	29	2	5	52	208
Yelloweye rockfish	0	5	1	1	0	13	20

The species of rockfish caught inside of 20-fm, and for which mortality rates are derived, include black, blue, other nearshore rockfish, canary, and yelloweye. The distribution of discarded fish by species and depth bin (fm) based on at-sea observations are identified in Tables 4-35a-e. Observed distributions are presented for all-depth fisheries, and predicted distributions are presented for fisheries closed seaward of 40-fm, 30-fm, 20-fm, and 10-fm.

Table 4-35a. Distribution of released fish observed by depth bin (fm) when open all depths.

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	> 40 fm	Sample Size
Black rockfish	43%	54%	3%	0%	0%	0%	688
Blue rockfish	21%	72%	6%	1%	0%	0%	858
Other nearshore rockfish	9%	73%	18%	45%	0%	0%	16
Canary rockfish	6%	51%	14%	1%	2%	25%	208
Yelloweye rockfish	0%	25%	5%	5%	0%	65%	20

Table 4-35b. Predicted distribution of released fish when closed outside 40 fm.

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	Sample Size
Black rockfish	43%	54%	3%	0%	0%	688
Blue rockfish	21%	72%	6%	1%	0%	858
Other nearshore rockfish	6%	50%	13%	31%	0%	16
Canary rockfish	8%	69%	19%	1%	3%	156
Yelloweye rockfish	0%	71%	14%	14%	0%	7

Table 4-35c. Predicted distribution of released fish when closed outside 30 fm.

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	Sample Size
Black rockfish	43%	54%	3%	0%	688
Blue rockfish	21%	72%	6%	1%	858
Other nearshore rockfish	6%	50%	13%	31%	16
Canary rockfish	9%	71%	19%	1%	151
Yelloweye rockfish	0%	71%	14%	14%	7

Table 4-35d. Predicted distribution of released fish when closed outside 27 fm.

Species	≤10 fm	11-20 fm	21-25 fm	Sample Size
Black rockfish	43%	54%	3%	686
Blue rockfish	21%	73%	6%	853
Other nearshore rockfish	9%	73%	18%	11
Canary rockfish	9%	72%	19%	149
Yelloweye rockfish	0%	83%	17%	6

Table 4-35e. Predicted distribution of released fish when closed outside 20 fm.

Species	≤10 fm	11-20 fm	Sample Size
Black rockfish	44%	56%	668
Blue rockfish	23%	77%	805
Other nearshore rockfish	11%	89%	9
Canary rockfish	11%	89%	120
Yelloweye rockfish	0%	100%	5

Mortality rates for fish discarded by depth strata are detailed in Table 4-36. A mortality rate of 100% would be applied to all rockfish caught and discarded in waters deeper than 20-fm. These mortality rates were applied to the species distributions (Table 4-35) to determine the comprehensive mortality rates detailed in Table 4-37. These comprehensive mortality rates are applied to estimated discard, calculating estimated discard mortality.

Table 4-36. Mortality rates developed by the GMT for use in the Oregon recreational fishery.

Mortality rate	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	> 40 fm
Black rockfish	10%	40%	100%	100%	100%	100%
Blue rockfish	10%	40%	100%	100%	100%	100%
Other nearshore rockfish	10%	50%	100%	100%	100%	100%
Canary rockfish	10%	50%	100%	100%	100%	100%
Yelloweye rockfish	10%	50%	100%	100%	100%	100%

Table 4-37. Recommended mortality rates for all-depth fisheries and fisheries closed outside of 40 fm, 30 fm, 25 fm, 20 fm and 10 fm.

Species	<=10 fm	<= 20 fm	<= 25 fm	<= 30 fm	<= 40 fm	All depth
Black rockfish	10%	27%	29%	29%	29%	29%
Blue rockfish	10%	33%	37%	37%	37%	37%
Other nearshore rockfish	10%	46%	55%	69%	69%	69%
Canary rockfish	10%	46%	56%	57%	58%	69%
Yelloweye rockfish	10%	50%	58%	64%	64%	88%

A 7 percent mortality rate is applied in the Oregon recreational groundfish fishery for discarded lingcod, cabezon, and greenling species. In addition, a 7 percent mortality rate is used for the shore and estuary boat fisheries for all species discarded because, as barotrauma is not an issue, mortality is mostly related to hook location.

Model Inputs

Daily bag limits, offshore closures, minimum length changes, effort increases, and abundance trends are the basic input factors applied to the standardized 2005 model.

Bag limits were modeled to range from 5 to 10 marine fish and 2 to 3 lingcod. The expected reduction in CPUE from reducing the marine bag limit from 10 fish is based on the same comparison used to normalize the 8 and 5 fish marine bag limits observed in the 2005 fishery. A linear relationship was assumed using the observations in going from 10 to 8 and 10 to 5 fish. The following rates (in percent) of decline in CPUE were used when reducing the bag from 10 fish: 9 = 5.5; 8 = 10.9; 7 = 20.0; 6 = 29.1; 5 = 38.2. As assumed in normalizing the model no effect on CPUE was expected for yelloweye rockfish and canary rockfish (no retention allowed).

The effect of increasing the lingcod bag limit from 2 to 3 fish was also analyzed. In the ocean boat fishery, sample data from 2005 was used to determine the proportion of anglers that had achieved their 2 fish bag limit in 2005 (6.3%). An increase of 10.6 percent of the estimated landings resulted, assuming the same anglers would achieve a 3 fish bag limit. Applying the same approach to discard data results in a reduction of the estimated discard of 15.6 percent. Similar adjustments were made to the estimated landings in the shore and estuary fisheries to reflect an increase in the bag limit (8.5 percent increase in landings). No reductions were made to the estimated discards in the shore and estuary fisheries as most anglers quit fishing when they achieve their lingcod bag limit. No adjustments were made for increased targeting due to the increased bag limit. Discussions with anglers and charter operators indicate any likely increase in targeting lingcod would occur in offshore areas, for which opportunity is drastically reduced due to offshore closures.

The effect of lingcod minimum length reductions from 24-inches to 22 and 20-inches were analyzed for both the ocean boat and shore and estuary fisheries. The length profile of discards was developed from at-sea observations in the 2005 ocean boat fishery. These were applied to the estimated proportion of fish discarded in 2005 (42 percent of total fish caught based on ORBS estimates). It was assumed that all fish between 20 to 24-inches, and 22 to 24-inches would have been retained under the respective regulations. This resulted in an estimated increase in number of fish retained under minimum length regulations of 20 and 22-inches of 53.6 and 35.8 percent respectively. The estimated decrease in the amount of discarded fish under minimum length regulations of 20 and 22-inches was 72.3 and 58.3 percent respectively. The profile of discarded fish in the ocean boat fishery was used as a proxy for the shore and estuary fishery, as there exists no profile of the length of fish discarded in that fishery. This data was applied to the estimated proportion of fish discarded in the shore and estuary fishery (78 percent of total fish caught based on MRFSS estimates). As in the ocean boat fishery it was assumed that all fish now of legal size would have been retained as very few anglers attain the 2-fish bag limit. Because modeling of the shore and estuary fishery is based on past landings in metric tons, no estimate of additional landings in number of fish was calculated, only an expected increase in metric tons. The increase in landings estimated under the 20 and 22-inch minimum length requirements is 10 mt (equating to a discard reduction of 10 mt) and 7 mt (equating to a discard reduction of 7 mt) respectively.

Expected encounter rate reductions by species normally encountered in offshore waters (widow rockfish, canary rockfish, yelloweye rockfish and lingcod) were developed for offshore closures outside of 40, 30, 25, and 20 fm. For retention species (widow rockfish and lingcod) these include expected reduction rates for landed fish (Table 4-38) and discarded fish (Table 4-39). For non-retention species (yelloweye rockfish and canary rockfish) these include expected reduction rates for both discarded and the few illegally retained fish (Table 4-40). They were based on the same at-sea observations mentioned earlier in the report. Offshore effort (5 percent of total groundfish directed effort) was assumed to move to open areas nearshore during offshore closure periods.

Table 4-38. Percent reductions in landed widow rockfish and lingcod due to depth closures.

2001, 2003-2005 count of landed fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0	1	9	3	54	174	241
Lingcod	115	320	77	16	6	161	695
2001, 2003-2005 distribution of landed fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0%	0%	4%	1%	23%	72%	100%
Lingcod	17%	46%	11%	2%	1%	23%	100%
Percent reduction in landed fish from open all depth to depth closure							
Species	Closed >10 fm	Closed >20 fm	Closed >25 fm	Closed >30 fm	Closed >40 fm		
Widow rockfish	100%	100%	96%	95%	72%		
Lingcod	83%	37%	26%	24%	23%		

Because smaller lingcod would be legal to retain under the proposed regulations reducing the minimum length to 22 and 20-inches, the average weight of both landed and discarded fish in the ocean boat fishery was also adjusted. The estimated number of fish at 22 and 20-inches that now would be landed was factored by the appropriate average weight (kg) resulting in a revised total metric tons landed. This new weight was divided by the estimated number of fish landed (landings in 2005 plus additional fish, reflecting the appropriate minimum length regulation) to determine a revised average weight. This resulted in a 13.3 percent reduction in average size under the 22-inch regulation and a 19.6 percent under the 20-inch regulation. This same process was used for the discarded fish resulting in a 59.1 percent reduction under the 22-inch regulation and a 78.7 percent reduction under the 20-inch regulation. There was no adjustment in the shore and estuary fishery as the number of fish and average weight are not part of the calculation of metric tons landed.

Table 4-39. Percent reductions in released widow rockfish and lingcod due to depth closures.

2001, 2003-2005 count of released fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0	2	0	0	3	0	5
Lingcod	269	633	110	36	13	46	1103
2001, 2003-2005 distribution of released fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0%	40%	0%	0%	60%	0%	100%
Lingcod	24%	57%	10%	3%	1%	4%	100%
Percent reduction in released fish from open all depth to depth closure							
Species	Closed >10 fm	Closed >20 fm	Closed >25 fm	Closed >30 fm	Closed >40 fm		
Widow rockfish	100%	60%	60%	60%	0%		
Lingcod	76%	19%	9%	5%	4%		

Table 4-40. Percent total encounter reductions in yelloweye rockfish and canary rockfish due to depth closures.

2001, 2003-2005 count of total encounters (released + landed) by depth bin (fm), open all depth							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Canary rockfish	33	244	65	25	20	120	507
Yelloweye rockfish	1	19	11	6	4	29	70
2001, 2003-2005 distribution of total encounters (released + landed) by depth bin (fm), open all depth							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Canary rockfish	7%	48%	13%	5%	4%	24%	100%
Yelloweye rockfish	1%	27%	16%	9%	6%	41%	100%
Percent reduction in total encounters (released + landed) from open all depth to depth closure							
Species	Closed >10 fm	Closed >20 fm	Closed >25 fm	Closed >30 fm	Closed >40 fm		
Canary rockfish	93%	45%	33%	28%	24%		
Yelloweye rockfish	99%	71%	56%	47%	41%		

Abundance trends were only developed for lingcod. The average annual increase in impacts used was 1.17 percent and continues the same rate used for modeling the 2004-2006 fisheries. This increase was applied on a yearly basis. Thus for 2007 a 1.37 increase was used (2005 normalized catch x 1.17 x 1.17 representing increases from 2005 to 2006 and to 2007) and for 2008 a 1.6 increase was used (2005 normalized catch x 1.17 x 1.17 x 1.17).

Groundfish directed angler effort was assumed to remain equal to normalized 2005 under a 6 to 12 month season even during periods of offshore closures. For action alternative 1a, it was assumed that 33 percent of the angler effort from the closed period would shift to the open period resulting in 60 percent of annual effort (40 percent of annual effort normally occurs in the July through Labor Day period).

Angler effort in the directed Pacific halibut fishery was assumed to increase in 2007-2008 so as to harvest the complete halibut allocation. The halibut allocation was assumed to be equal to the 2006 allocation, which is four percent higher than in 2005. For action alternative 1b, having the lowest estimated yelloweye rockfish impact (1.5 mt), it was assumed that halibut effort and catch would be reduced by 30 percent.

Model Description

The model was divided into landed and discarded fish sections. Each section had similar components although the discarded section also had components to apply both mortality rates and changes in average size due to offshore closures. Groundfish impacts on yelloweye rockfish and canary rockfish in the Pacific halibut fishery were modeled separately.

The normalized 2005 impact model (all ocean boat fishery sources, excluding the targeted Pacific halibut fishery), include the following components for each species by month: (1) standardized catch; (2) bag limit affects; (3) offshore fishery effects on encounter rates; (4) 5 percent effort shifts to the nearshore fishery due to offshore closures; (5) average size; and (6) minimum length changes for lingcod. For landed and discarded fish the methodology to address the affects of various marine bag limits and offshore closures on (a) encounter rates and (b) shifting effort nearshore, were discussed earlier in the Normalization section. For landed and discarded lingcod, the methodology to address the affects of bag limits and changes in minimum length were discussed earlier in the Model Input section. Average weight was based on 2005 landed weight and at-sea observations for discarded fish as discussed earlier also in the Normalization section. Discarded fish mortality rates by rockfish species and depth were developed from at-sea observer data for catch distribution using mortality rates by species and depth.

Expected impacts on yelloweye rockfish and canary rockfish in the Pacific halibut fishery were addressed separately. The 2005 encounter rate per halibut pound landed, and the 2002-2003 average weight of fish caught shoreward of 30-fm, was applied to the 2006 Oregon central coast all-depth halibut sport allocation to address expected impacts on both species. This assumes similar Pacific halibut allocations in 2007-2008.

Landings and discard impacts for shore and estuary caught species were modeled on a season total basis using the 1998-2002 average impacts (mt). This fishery will be managed for a year round season as it does not impact yelloweye rockfish and canary rockfish. The impacts were adjusted to reflect length limits applied to cabezon and greenling since that period. Sublegal cabezon and greenling that were landed in the 1998-2002 period were now considered discards. A mortality rate of 7 percent was applied to all species discarded in the shore and estuary fishery to represent hooking mortality as the waters are not deep enough to cause mortality from barotrauma.

4.5.1.8 Modeling California Recreational Impacts

The CDFG revised their impact projection model that was reviewed by the GMT at their February 2006 meeting. The GMT recommends this updated model for use in projecting impacts of groundfish species in 2007-2008 California recreational fisheries. This model is described below and is used in impact analyses in this EIS.

Introduction

Recreational fisheries management for multispecies assemblages in California presents many challenges. In recent years, declining stocks of several rockfish species have dictated recreational groundfish management seasons and depths in California. Increasingly complex restrictions have been necessary to provide fishing opportunities that keep total catch of overfished species within the reduced limits that are necessary to rebuild the stocks.

Prior to 2000, the recreational daily bag limit for rockfish was 15 fish per angler and there were no closed months or depths. Beginning in 2000, the daily bag limit was reduced to 10 fish. Regulations have changed each year since 2000, making analysis of the effect of particular regulations difficult to determine. In addition, regulations have become more region-specific, adding to the difficulty of modeling projected catches.

Methodology Used to Project Recreational Catches for 2007-2008

Background

The recreational catch model incorporates a number of parameters and assumptions, all of which are either risk-neutral or risk-adverse. The basic analytical approach is the same as that used for 2005-2006, with new data from the California Recreational Fishery Survey (CRFS) program to serve as a baseline. Model output predicts expected catch under any combination of season and depth fishing restrictions by region.

Management Region Definitions:

North Region:	North of 40°10' N latitude to CA/OR border
North-Central Region:	South of 40°10' N latitude to 37°11' N latitude (Pigeon Pt.)
South-Central Monterey Region:	South of Pigeon Pt. to 36° N latitude (Lopez Pt.)
South-Central Morro Bay Region:	South of Lopez Pt. to 34°27' N latitude (Pt. Conception)
South Region:	South of Pt. Conception to CA/Mexico Border

CDFG/California Recreational Groundfish Model Assumptions

Effort Shift Inshore: The model includes a 27.6% increase in expected landings when fishing is restricted to less than 30 fm and a 39.3% increase in expected landings when fishing is restricted to less than 20 fm. The increase, or effort shift, is to account for increased effort in a smaller fishing area.

Discard Mortality: 1) Canary, cowcod, and yelloweye are non-retention species which have high mortality rates when caught and released. Therefore, expected mortality estimates for these species also include B2 fish (fish reported to be released live) with hooking mortality rates as follows:
10.5 % for the depth range 0-10 fm; 42% for 10-20 fm; and 100% for depths greater than 20 fm.
2) CA Scorpionfish hooking mortality rate is assumed to be 5%. This rate is applied to expected landings of CA Scorpionfish when fishing is allowed for species which associate with CA scorpionfish, but fishing for CA Scorpionfish is not allowed.

Inputs and Key Parameters for the Model

Weighting of Base Years: Base year catches from 2004 and 2005 are combined together in this version of the model using a 0.67 decay function (which translates into a weighting of 60% for 2005 and 40% for 2004). Model output predicts expected catch under any combination of season and depth fishing restrictions by region. *Reasons for weighting the 2005 estimates more heavily than the 2004 estimates include:* the recognition that constraints placed on salmon fishing in 2005 will likely persist over the next several years; and the acknowledgement that the expanded distribution and greater abundance of blue rockfish (as well as other groundfish species) due to cooler oceanographic conditions will also likely persist into 2007 and 2008. *Reasons for using 2004 data include:* the recognition that oceanographic conditions in 2005 were unusual while conditions in 2004 are more in line with what might be expected in 2007-2008 under a colder water regime; and the expectation that the bulk of blue rockfish take (and potentially brown and olive rockfish take) will occur within deeper nearshore waters as was observed in 2004 rather than in the shallow nearshore waters as in 2005.

Base Year Catch: Initially, CRFS catch estimates in WEIGHT of fish were summed for caught and retained (CRFS "A" catch), filleted/caught and released dead (CRFS "B1" catch), and for species of concern, a proportion of CRFS "B2" catch (released alive) derived using depth-based mortality estimates. Base year catch estimates are assumed to be for an unrestricted fishing year with no months closed and no depths closed. Therefore, for each year, a back calculation method was used to add a catch estimate for what the catch would have been if all months and all depths had been open. This back calculation uses percent catch by month and depth derived from historical catch estimates.

Historical Catch By Month: Estimates of historical percent catch by two-month period were calculated for each region based on RecFIN Marine Recreational Fisheries Statistics Survey (MRFSS) data (weight of A+B1) from 1993-1999, which was a time period when seasons and depths were unconstrained.

Proxies were considered on a species by species basis for regions where there was a lack of catch data for that area. Monthly estimates of percent catch then were divided equally (50:50) for each pair of months.

Historical Catch By Depth: Estimates of percent catch by depth were calculated for each region based on RecFIN MRFSS depth sample data (numbers caught A+B1 for CPFV and A+B1+B2 for PR) from 1999-2000, which was a time period when depths were unconstrained. Proxies were considered on a species by species basis for regions where there was a lack of catch data for that area.

Methodology used to Calculate Annual Unrestricted Catch

1. Pull (A + B1) Catch for each year from the RecFIN CRFS data web site: http://www.psmfc.org/recfin/forms/est2004.html.
   Specify species, and select the parameters: month and district under Define Table Layout.
2. Pull historical catch by depth (1999-2000, most recent years unregulated by depth) from the RecFIN boatdepth2 site:
   http://www.psmfc.org/recfin/forms/boatdepth2.html
   Add PC and PR fish caught together for each separate region and species, maintaining combined depth totals for each depth strata. Calculate average percentage of total fish caught within each 10 fm depth stratum (= "Depth Profile") by dividing 10 fm depth strata totals by combined total sum of all strata for the region. Assign proxies as needed for data-poor areas, using adjacent regions, similar species, etc.
3. Pull historical catch through time (1993-1999, the most recent years unregulated by monthly closure) from RecFIN web site:
   http://www.psmfc.org/recfin/forms/est.html
   Calculate average wave %'s over combined years 1993-1999 by dividing individual wave totals by sum of all waves for each region. Assign proxies as needed for data-poor areas using the other region (North or South) as the proxy.
4. For each management region and species, calculate total regulated catch based on months each set of regulations was in effect. For example, if fishing was only open from 0-60 fm for March-December, sum total catch for those months only. If using B2 (reported catch released live) mortality, add calculated B2 mortality to these catch totals. Each management region should now have catch data for all species grouped by the different sets of management regulations (MR sets) in effect for the year so that the identical calculations can easily be performed on identically restricted species.
5. **Expanding to All Depths**. For each MR set: If there was **no** depth restriction, use the unmodified total regulated catch as the expected catch for all depths for that period of the year. If a depth restriction was in place, use total regulated catch to expand out each species in each MR set to all depths: from the Depth Profile, divide total regulated catch by sum of proportion of catch represented by the depths where fishing was open. This is the total expected catch for all depths. For example, if fishing for a MR set was open < 20 fm, divide the total catch by the percentage of the catch < 20 fm using the appropriate Depth Profile (historical unregulated catch data) for each species and region.
6. **Effort Shift**. If the depth restriction is confined to a 20 or 30 fm band, we assume increased effort occurred for these months. To remove this effect, apply an Effort Shift factor to remove the increased fishing (and increased catch) for the constrained depth zone. For example, if a 0-20 fm restriction was in effect, divide the total expected catch for all depths by 1.393 to get final total expected catch for those months. Similarly, use a factor of 1.276 if fishing was restricted within a 30 fm range. No Effort Shift is applied for depth restrictions > 30 fm.

7. **Accounting for Closed Months**. After expanding to all depths and removing Effort Shift (if needed), sum all the final expected catch values across all the MR sets for the year for each management region and species. Divide this sum by the % catch for the year that these regulated months represent (from the wave %'s for the year). In other words, divide the calculated catch for all open months by the percentage of the catch for the year these months historically represent. This results in the expected annual unregulated catch, expanded out from the regulated catch, for each region and species.
8. Input expected annual unregulated catch for each region-species into the Catch by Year Table in the RecFIN Model database. The weighting of the different years' data to be used by the model in projecting catch can be selected at the model-user interface.

Estimates of Total Mortality for Canary and Yelloweye Rockfish Using Two Different Methods for Estimating Discarded Catch

The California recreational catch projection model accounts for total mortality by combining A (sampler examined), B1 (discarded dead/filleted) and a portion of B2 (discarded alive) catch. To calculate the portion of B2 to include in the total mortality estimate, California staff apply mortality rates to the B2 catch component in the following manner: 10.5% for fish caught between 0-10 fm, 42% for fish caught between 10-20 fm, and 100% mortality for all other depths. Oregon and Washington account for total mortality by combining A (sampler examined) and a portion of a combined B catch (catch discarded dead or alive, or catch otherwise unavailable to be examined). Staff from these states apply a 50% mortality rate to the B catch component for fish caught between 0-20 fm and 100% mortality to the B fish caught at all other depths.

To determine which of these methods was more conservative in estimating total mortality, a comparison of the methods was made for canary and yelloweye rockfish taken by California anglers statewide using 2004 and 2005 CRFS A, B1, and B2 annual catch estimates. For this comparison, the type B and B1 fish included catch used as bait, given to other anglers, or otherwise not available for examination.

The total mortality estimates calculated by these two different methods are provided in Table 4-41.

Table 4-41. Total Mortality Estimates (mt) Calculated from Two Different Methods Using 2004 and 2005 California Recreational Fisheries Survey A, B1, and B2 Annual Catch Estimates.

Species	Year	Total Mortality (mt)	
		Combined B[a/] Method	B1 & B2[b/] Method
Canary	2004	NA	NA
	2005	6.8	7.1
Yelloweye	2004	2.7	3
	2005	5.1	5.6

a/ Mortality estimate includes A catch + mortality rates applied to discarded catch combined together (Combined B).

b/ Mortality estimate includes A catch + B1 catch + mortality rates applied to B2 catch (discarded catch (B1 &B2) treated separately).

The "Combined B" method consistently results in lower total mortality catch estimates; that is, it results in lower discard mortality than the "B1 & B2" method. Thus, the California recreational catch projection model uses a more conservative estimate for discard mortality, leading to a higher estimate of overall mortality. However, more analyses may be needed after the PFMC RecFIN Workshop in August, when further discussions will be held on what constitutes the discard catch (type "B") for Washington, Oregon, and California.

Estimation of Impacts

The CDFG is proposing the seasons described under Action Alternatives 1-3 in Chapter 2. The estimated impacts to select groundfish species in 2007 and 2008 California recreational fisheries by region are described in section 4.5.4.

Action Alternative 3 includes an increase in the greenling bag limit from one to two fish. CDFG used the RECFIN methodology for Hypothetical Bag Limit Analyses available at http://www.psmfc.org/recfin/forms/bfreq.html to determine increased impacts on greenlings resulting from this change. The program uses the A+B1+B2 fish from 2004 for estimating the increased impact based on all fish encountered. The A fish are sampled dead fish. CDFG assumes for greenling that B1 includes filets and there were no fish thrown back dead as kelp greenling usually survive release. B2 includes live fish over the bag limit or under the size limit of 12". Since there is no way to estimate the proportion of fish that were undersized, this analysis also assumes there were no fish thrown back as sublegal and assumes that all B2 fish would be available if the bag limit were increased as the most conservative estimate. All bags over the hypothetical limit are then set to the hypothetical limit to calculate increased take. The increased estimated impact on greenlings would be 15% based on this analysis. Even with the increase in catch, landings are expected to stay within the CDFG recreational allocation as greenling landings in 2005 were 37% of the allocation.

Action Alternative 1 includes a reduction in the bocaccio bag limit from Cape Mendocino to the Oregon border from 2 to 1 fish to protect bocaccio under the lower OY. The estimated saving in bocaccio as a result of this change is not possible to determine because the data cannot be summarized for only this region. Bocaccio is at the northern end of its distribution in this part of the state and the fishing effort is low relative to other regions. The estimated take of bocaccio in 2005 was minimal in this region, therefore some small but undetermined amount of savings would be expected. Action Alternative 3 includes an increase in the bocaccio bag limit from one to two fish for the area south of Cape Mendocino so that the statewide bag limit would be two fish. CDFG used the RECFIN methodology for Hypothetical Bag Limit Analyses available at http://www.psmfc.org/recfin/forms/bfreq.html to determine increased impacts on bocaccio resulting from this change. The program uses the A+B1 fish from 2004 and 2005 for estimating the increased impact. The A fish are sampled dead fish. CDFG assumes for bocaccio that B1 includes filets and fish thrown back dead (over the bag limit) as bocaccio do not usually survive release. There is no way to estimate the proportion of B2 fish that were undersized or the proportion thrown back alive. Therefore, B2 fish were not included as CDFG assumed most of the B2 fish were sublegal and there would be very few legal fish released alive. All bags over the hypothetical limit are then set to the hypothetical limit to calculate increased take. The increased estimated impact on bocaccio would be 27% based on this analysis. Landings are still expected to stay within the CDFG recreational allocation as bocaccio landings in 2005 were 64% of the allocation.

There have been anecdotal suggestions that there has been good bocaccio recruitment in southern California during 2003 and/or 2004. Those fish would be expected to recruit first to the recreational fishery in 2006 or 2007, so that additional unknown and unquantified impacts from new recruits could also occur, however, CDFG reviewed the 2005 and 2006 CRFS sample data to look for a spike in small fish with no success.

Action Alternative 1 includes a reduction in the lingcod bag and size limit from the No Action Alternative of two fish at 24" to one fish at 22" to reduce fishing effort for lingcod, thereby reducing impacts on associated rebuilding species. The estimated increase in lingcod take as a result of reducing the size limit from 24" to 22" would be 26% using the formula:
Total Catch from 24" /(1 - 0.207) = Adjusted Catch

Reducing the bag limit from two to one fish at 22" would reduce this estimated increase by 27% based on the formula:
Adjusted Catch x (1 - 0.27) = Estimated Catch under a one fish bag limit.

Using the Total Catch estimate (300 mt) from 2005, the overall reduction in catch would be 24 mt or eight percent. Data from 1995 – 1997 were used to estimate size reduction increases and bag limit decreases when a 22" size limit was in effect.

Lingcod Bag and Minimum Size

CDFG is continuing to propose alternatives to fishery closure as an inseason management response to projected over harvest of lingcod if it occurs. If the CDFG determines that more restrictive management measures are necessary to slow the harvest of lingcod, an increase in the minimum size limit, or a reduction in the bag limit from two to one, may be implemented. Projected harvest for each upcoming month may be multiplied according to the coefficients for size and/or bag limit to identify the management response necessary to keep projected catch within the recreational harvest guideline.

Coefficients to modify projected catch of lingcod from a two-fish bag limit to a one-fish bag limit, or from 24" to a smaller or larger minimum size are shown in Table 4-42.

Table 4-42. Coefficients used to model lingcod bag and size limits in the California recreational groundfish fishery.

Size Limit (inches)	Size Coefficient	Bag Limit Coefficient
22	0.207	0.27
24 (status quo)	0	0.214
25	0.169	0.18
26	0.304	0.15
27	0.43	0.12
28	0.521	0.1
29	0.581	0.07
30	0.641	0.039
31	0.685	0.025
32	0.723	0.011

4.5.2 Allocating Depleted Species' Impacts

The three action alternatives discussed in sections 2.2.3.2 - 2.2.3.4 indicate ways in which the allowable impacts to depleted species may be divided between sectors. Under increasingly low OYs, such ad hoc allocations become even more critical, as the values selected may significantly constrain fisheries' access to healthy stocks and target OYs. In order to explore hypothetical allocation scenarios under the high and low OYs, the Council requested that the GMT produce a number of tables (called "bycatch scorecards") in which depleted species impacts are attributed to sectors following different allocation strategies. Each of these eight scorecards is discussed below, in addition to the assumptions and methodology employed to construct them.

Past relationships between sectors (i.e., their relative contribution toward the total mortality impact for a particular species) provide instructive templates for these hypothetical allocation scenarios. Therefore, at the Council's request, the scorecard of final 2005 mortality estimates and the scorecard projecting impacts in 2006 were used as the starting points from which to explore allocation options. As explained in the description of the No Action Alternative (section 2.2.3.1), factors such as the behavior of fishery participants and natural conditions caused certain sectors to exceed their expected harvest, while other sectors accounted for less mortality than had been originally estimated. For example, in 2005 the Washington and Oregon recreational fisheries exceeded their harvest guideline for yelloweye rockfish. These kinds of situations are captured in the 2005 scorecard, so that the relationships between sectors reflect what actually happened (rather than what was anticipated); this suggests that such proportions may be highly dependent on the particular circumstances that occurred in 2005 and so may not apply accurately to future conditions. The relationships between sectors within the 2006 scorecard represent those initially intended by the Council from the 2005-2006 harvest specifications process (in addition adjustments made to correct problems, such as those encountered in 2005); however these projections contain uncertainty as to how well management measures will operate to correctly constrain the fisheries.

In constructing these scorecards, numerous assumptions were made, following Council guidance. First, it was assumed that the impacts associated with the incidental groundfish open access sector and the tribal sector would not change under the Council's action, as these sectors are managed through separate regulations. The impacts associated with research were maintained at status quo, or in the cases of bocaccio, widow rockfish, and yelloweye rockfish, the anticipated research take was increased to provide for additional studies on depleted and co-occurring species. The low yelloweye rockfish OY scenario, however, does not accommodate this increase in the amount reserved for research. The impacts associated with these three sources were therefore held constant across all of the scorecards.

4.5.2.1 High OY Alternatives

For most species, the impact estimates attributed to each sector in 2005 and in 2006 can be directly applied to the high OY alternatives (Table 4-43 and Table 4-44, respectively). For example, limited entry bottom trawl accounted for 46.6 mt of bocaccio mortality in 2005; 46.6 mt of bocaccio mortality can still be accommodated under the 2007-2008 high OY alternative of 218 mt. Continuing with the example of bocaccio, the 2005-2006 OY is nearly 100 mt greater than the high OY alternative for that stock. However the total estimated catch in 2005 was far less than the OY, which resulted in a large residual amount; by carrying over the same mortality estimates for the sectors, the 2007-2008 high OY alternatives can also provide for a residual to buffer against uncertainty, but it is a smaller value. Although this situation holds true for most of the depleted species, there are two exceptions. For the canary rockfish OY alternative, the impact estimates in both 2005 and 2006 are greater than what can be accommodated under the canary rockfish high OY alternative of 44 mt. Therefore, following Council guidance, each sector's canary rockfish impact was reduced proportionately in order to create a 0.5 mt set-aside. Similarly, the 2008 yelloweye rockfish OY alternative (20 mt) is too small to maintain past mortality impacts; to resolve this, the necessary proportional reductions were made to each sector's impacts, however no set-aside was created.

Table 4-43. 2007-2008 estimated total mortality: High OY applied to the status quo 2006 scorecard.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Y'eye 2007	Y'eye 2008
Limited Entry Trawl- Non-whiting	47.4	7.5	2.7	160.3	63.3	1.0	0.3	0.3
Limited Entry Trawl- Whiting								
At-sea whiting motherships		4.5		4.7	1.0	200.0	0.0	0.0
At-sea whiting cat-proc				6.3	2.9		0.0	0.0
Shoreside whiting				5.2	1.8		0.0	0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0	0.0
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0	0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9	2.4
Open Access: Directed Groundfish	10.6	2.9	0.1	0.2	0.1	0.1	3.0	2.5
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)								
Recreational Groundfish								
WA		1.6					3.5	3.0
OR		6.6				1.4	3.2	2.7
CA	98.0	9.0	0.4			8.0	3.7	3.1
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	3.0
Non-EFP Total	173.7	43.5	3.4	181.9	77.4	260.4	22.6	20
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	173.7	43.5	3.4	181.9	77.4	260.4	22.6	20.0
2007-2008 High OY Alt.	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	**20**
Difference	44.3	0.5	4.6	47.2	22.6	107.6	0.4	0.0
Percent of OY	79.7%	98.8%	42.5%	79.4%	77.4%	70.8%	98.1%	99.8%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-44. 2007 estimated total mortality: High OY applied to the 2005 scorecard.

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Y'eye 2007	Y'eye 2008
Limited Entry Trawl- Non-whiting	46.6	9.5	2.7	135.9	61.0	1.0	0.4	0.3
Limited Entry Trawl- Whiting								
At-sea whiting motherships							0.0	0.0
At-sea whiting cat-proc		3.3		16.4	2.1	155.8	0.0	0.0
Shoreside whiting							0.0	0.0
Tribal whiting		0.6		0.0	0.6	6.1	0.0	0.0
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0	0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9	2.5
Open Access: Directed Groundfish	10.6	3.0	0.1	0.2	0.1	0.1	3.0	2.5
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)								
Recreational Groundfish								
WA		1.4					5.4	4.4
OR		5.4				1.6	4.2	3.5
CA	37.3	2.0	0.4			1.6	0.9	0.8
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	3.0
Non-EFP Total	112.2	35.0	3.4	157.7	71.5	210.0	22.8	20.0
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	112.2	35.0	3.4	157.7	71.5	210.0	22.8	20.0
2007-2008 High OY Alt.	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	**20**
Difference	105.8	9.0	4.6	71.4	28.5	158.0	0.2	0.0
Percent of OY	51.5%	79.7%	42.5%	68.8%	71.5%	57.1%	99.0%	99.8%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

4.5.2.2 Low OY alternatives

In order to constrain fisheries below the OYs under the low alternatives, Action Alternative 1 management measures are more stringent than those under status quo (Action Alternative 1 is explained in section 2.2.3.2).

As was done for the high OY alternatives, scorecards were produced in which the 2005 and 2006 mortality impact estimates were reduced proportionately in order to be constrained to the low OY alternatives (Table 4-45 and Table 4-46, respectively). With the exception of cowcod, there are no residuals associated with any of the species; setting aside a portion of the OY to buffer against uncertainty would create even more extreme effects for sectors than those already anticipated under full utilization of the OYs (see chapter 7 for further discussion of the socio-economic impacts of a suite of low OYs).

Table 4-45. 2007-2008 estimated total mortality: Low OY applied to the status quo 2006 scorecard (each sector's projected impact is reduced proportionately).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	10.0	4.9	2.7	113.7	32.9	0.3	0.1
Limited Entry Trawl- Whiting							
At-sea whiting motherships				3.3	0.5		
At-sea whiting cat-proc		3.0		4.5	1.5	66.9	
Shoreside whiting				3.7	0.9		
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	2.8	0.8	0.1	0.9	0.2	0.2	1.3
Open Access: Directed Groundfish	2.2	1.9	0.1	0.1	0.1	0.0	1.4
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		1.1					1.6
OR		4.3				0.5	1.5
CA	20.7	5.9	0.4			2.7	1.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	3.4	130.0	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	3.4	130.0	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32.0**	**4.0**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	85.9%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-46. 2007-2008 estimated total mortality: Low OY, applied to the 2005 scorecard (each sector's estimated impact is reduced proportionately).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	15.4	8.0	2.7	111.5	34.6	0.4	0.2
Limited Entry Trawl- Whiting							
At-sea whiting motherships							
At-sea whiting cat-proc		2.8		13.5	1.2	68.5	
Shoreside whiting							
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	4.4	1.0	0.1	1.1	0.2	0.2	1.3
Open Access: Directed Groundfish	3.5	2.5	0.1	0.2	0.1	0.0	1.4
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		1.6					2.4
OR		4.1				0.7	1.9
CA	12.3	1.7	0.4			0.7	0.4
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	3.4	130.1	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	3.4	130.1	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32.0**	**4.0**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	85.9%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Employing proportional reductions to constrain to the low OYs, as described above, continues status quo Council policy to provide fishing opportunities across regions and sectors; this is consistent with guidance in the Groundfish FMP that "overfishing restrictions and recovery benefits should be fairly and equitably allocated among sectors of the fishery" {PFMC 2004}. However, there are numerous other allocation strategies that could be adopted (through revision of the Groundfish FMP), depending on the management objective sought by the Council; under the constraints of low OYs, such as those within these alternatives, these strategies may provide for a more viable fishery at a coastwide level. Other sections in this EIS also discuss allocation strategies, each of which is based on alternative management objectives. In chapter 7, for example, it is noted that under a highly constrained fishery, allocation could optimize coastwide revenue by allowing mortality impacts only for fisheries that account for the greatest amount of ex vessel revenue, eliminating the fisheries that account for the lowest ex vessel revenue. In this section, another scenario is depicted, in accordance with Council guidance: all of the mortality impacts are associated with either the recreational sector (Tables 4-47 and 4-48) or the commercial sector and (Tables 4-49 and 4-50). These are extreme scenarios that depict a situation that the Council might consider under OYs so constraining that all sectors operating under status quo could not be maintained.

Like the scorecards discussed above, those representing the "all recreational" and "all commercial" scenarios are based on the 2005 scorecard and the 2006 scorecard. That is, for example, the relationships between the commercial sectors are maintained at 2005 proportions (Table 4-50), while zero mortality impacts are estimated for the three recreational groundfish fisheries. Under the "all recreational" scenarios (Tables 4-47 and 4-48) however, the Council provided guidance that commercial fisheries should be constructed using OYs of the species for which there is no recreational fishery mortality. As such, POP and darkblotched rockfish were divided between the LE bottom trawl and whiting sectors using 2005 or 2006 scorecard proportions, as these two sectors are judged to be the only commercial fisheries that can be executed without mortality of other depleted species.

Table 4-47. 2007-2008 estimated total mortality: Low OY, applied to the status quo 2006 scorecard (all relevant projected impacts allocated to the recreational fishery).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting				112.7	32.7		
Limited Entry Trawl- Whiting							
At-sea whiting motherships				3.3	0.5		
At-sea whiting cat-proc				4.4	1.5		
Shoreside whiting				3.7	0.9		
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear							
Open Access: Directed Groundfish							
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		2.1					2.6
OR		8.3				10.5	2.3
CA	**35.7**	11.4	3.9			60.1	2.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	128.0	43.5	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	128.0	43.5	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	2.0	0.5	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	98.5%	98.9%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-48. 2007-2008 estimated total mortality: Low OY applied to the 2005 scorecard (all relevant estimated impacts allocated to the recreational fishery).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting				110.5	34.3		
Limited Entry Trawl- Whiting							
At-sea whiting motherships							
At-sea whiting cat-proc				13.3	1.2		
Shoreside whiting							
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	**3.7**	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear							
Open Access: Directed Groundfish							
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		4.7					3.9
OR		12.1				35.3	3.1
CA	**35.7**	5.0	3.9			35.3	0.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	127.7	43.5	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	127.7	43.5	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	2.3	0.5	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	98.2%	98.8%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-49. 2007-2008 estimated total mortality: Low OY applied to the status quo 2006 scorecard (all relevant projected impacts allocated to the commercial fishery).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	23.7	10.2	3.6	113.7	32.9	0.3	0.4
Limited Entry Trawl- Whiting							
At-sea whiting motherships				3.3	0.5		
At-sea whiting cat-proc		6.1		4.5	1.5	70.1	
Shoreside whiting				3.7	0.9		
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	6.7	1.6	0.1	0.9	0.2	0.2	3.6
Open Access: Directed Groundfish	5.3	3.9	0.1	0.1	0.1	0.0	3.7
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA							
OR							
CA							
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	130.0	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	130.0	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-50. 2007-2008 estimated total mortality: Low OY applied to the 2005 scorecard (all relevant estimated impacts allocated to the commercial fishery).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	23.6	12.2	3.6	111.5	34.6	0.4	0.5
Limited Entry Trawl- Whiting							
At-sea whiting motherships							
At-sea whiting cat-proc		4.2		13.5	1.2	69.9	
Shoreside whiting							
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	6.8	1.5	0.1	1.1	0.2	0.2	3.5
Open Access: Directed Groundfish	5.4	3.8	0.1	0.2	0.1	0.0	3.6
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA							
OR							
CA							
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	130.1	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	130.1	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

4.5.2.3 Comparing Allocation Scorecards with Action Alternatives

Management measures alternatives are developed based on the specific conditions of each fishery, such as what tools are available to managers and how the fishery is constrained by other depleted species; the relationships between sectors' mortality impacts estimates are not necessarily held constant from year to year. Similarly, the Action Alternatives detailed in Chapter 2 result in impact estimates that create different relationships between sectors than those that occurred in 2005 and projected for 2006 (Table 4-51). For example, the 2006 scorecard projects that canary rockfish mortality impacts will be shared between commercial and recreational sectors at a ratio approximating 48:52, while under Action Alternative 2, this relationship changes to approximately 59:41. These kinds of changes in proportions are also present within the commercial sector and within the recreational sector. For example, while the California recreational fishery accounts for approximately 52% of the total recreational impacts in 2006, under Action Alternative 2 the fishery's impacts are projected to account for 68%.

Table 4-51. Percent of impact by sector as a proportion of total impact (2005 and 2006).

		Boc	Can	Cow	Dkbl	POP	Wid	Yeye
2006 (status quo)	**% Commercial impact**	**42.1%**	**48.4%**	**87.9%**	**100.0%**	**100.0%**	**95.5%**	**37.3%**
	% Recreational impact	**57.9%**	**51.6%**	**12.1%**	**0.0%**	**0.0%**	**4.5%**	**62.7%**
2005	% Commercial impact	65.4%	65.9%	87.9%	100.0%	100.0%	98.0%	38.2%
	% Recreational impact	34.6%	34.1%	12.1%	0.0%	0.0%	2.0%	61.8%
Action Alt. 1	% Commercial impact	53.8%	52.2%	100.0%	100.0%	100.0%	97.5%	26.9%
	% Recreational impact	46.2%	47.8%	0.0%	0.0%	0.0%	2.5%	73.1%
Action Alt. 2	% Commercial impact	70.2%	59.4%	96.9%	100.0%	100.0%	96.5%	37.3%
	% Recreational impact	29.8%	40.6%	3.1%	0.0%	0.0%	3.5%	62.7%
Action Alt. 3	% Commercial impact	41.1%	54.9%	91.2%	100.0%	100.0%	86.7%	41.2%
	% Recreational impact	58.9%	45.1%	8.8%	0.0%	0.0%	13.3%	58.8%
2006 (Status quo)	**Commercial Groundfish impacts**							
	LE Trawl- Non-whiting	**66.4%**	**46.7%**	**93.1%**	**90.1%**	**91.1%**	**0.5%**	**4.8%**
	LE Trawl- Whiting		**28.1%**		**9.1%**	**8.1%**	**99.2%**	
	LE Fixed Gear	**18.8%**	**7.2%**	**3.4%**	**0.7%**	**0.6%**	**0.2%**	**46.8%**
	OA: Directed Groundfish	**14.8%**	**18.0%**	**3.4%**	**0.1%**	**0.1%**	**0.0%**	**48.4%**
	Recreational Groundfish impacts							
	WA		**9.6%**					**33.7%**
	OR		**38.2%**				**14.9%**	**30.8%**
	CA	**100.0%**	**52.2%**	**100.0%**			**85.1%**	**35.6%**
2005	Commercial Groundfish impacts							
	LE Trawl- Non-whiting	66.0%	55.9%	93.1%	88.4%	95.9%	0.6%	6.3%
	LE Trawl- Whiting		19.4%	0.0%	10.7%	3.3%	99.0%	
	LE Fixed Gear	19.0%	7.1%	3.4%	0.8%	0.6%	0.3%	46.0%
	OA: Directed Groundfish	15.0%	17.6%	3.4%	0.1%	0.2%	0.1%	47.6%
	Recreational Groundfish impacts							
	WA		21.6%					51.0%
	OR		55.7%				50.0%	40.2%
	CA	100.0%	22.7%	100.0%			50.0%	8.8%
Action Alt. 1	Commercial Groundfish impacts							
	LE Trawl- Non-whiting	48.9%	47.9%	50.0%	86.7%	89.8%	0.2%	6.3%
	LE Trawl- Whiting		37.5%	0.0%	11.2%	8.3%	98.9%	
	LE Fixed Gear	29.0%	1.7%	25.0%	1.8%	1.7%	0.8%	37.5%
	OA: Directed Groundfish	22.0%	12.9%	25.0%	0.3%	0.3%	0.2%	56.3%
	Recreational Groundfish impacts							
	WA		9.7%					35.5%
	OR		22.6%				5.9%	36.9%
	CA	100.0%	67.7%	0.0%			94.1%	27.6%
Action Alt. 2	Commercial Groundfish impacts							

	LE Trawl- Non-whiting	67.8%	55.1%	93.5%	93.2%	94.5%	1.1%	6.5%
	LE Trawl- Whiting		29.4%	0.0%	6.1%	4.6%	98.2%	
	LE Fixed Gear	18.0%	3.7%	3.2%	0.6%	0.8%	0.6%	45.2%
	OA: Directed Groundfish	14.2%	11.8%	3.2%	0.1%	0.1%	0.1%	48.4%
	Recreational Groundfish impacts							
	WA		8.6%					34.6%
	OR		28.0%				3.0%	36.5%
	CA	100.0%	63.4%	100.0%			97.0%	28.8%
	Commercial Groundfish impacts							
	LE Trawl- Non-whiting	67.8%	50.0%	93.5%	91.2%	93.3%	0.8%	3.9%
	LE Trawl- Whiting		32.4%	0.0%	8.2%	5.9%	98.7%	
	LE Fixed Gear	18.0%	5.3%	3.2%	0.6%	0.7%	0.4%	45.1%
Action Alt. 3	OA: Directed Groundfish	14.2%	12.4%	3.2%	0.1%	0.1%	0.1%	51.0%
	Recreational Groundfish impacts							
	WA		9.8%					42.2%
	OR		28.6%				3.2%	39.9%
	CA	100.0%	61.6%	0.0%			96.8%	17.9%

4.5.3 No Action Alternative

[To be completed after the June Council meeting. For quantitative impact analysis of the No Action alternative, see 4.5.4.]

4.5.3.1 Limited Entry Trawl Impacts

4.5.3.2 Limited Entry Fixed Gear Impacts

4.5.3.3 Open Access Impacts

4.5.3.4 Nearshore Commercial Impacts

4.5.3.5 Tribal Fishery Impacts

4.5.3.6 Washington Recreational Impacts

4.5.3.7 Oregon Recreational Impacts

4.5.3.8 California Recreational Impacts

4.5.4 The Action Alternatives

When evaluating the impacts associated with the action alternatives, there are several general points that may be important to bear in mind.

First, as a depleted species' spawning stock biomass nears a rebuilt level ($B_{40\%}$), the probability of fishing encounters with that species increases. When more of the stock is available to the fishery but the allowable catch remains at a low level, there is a greater chance that the OY could be reached early in the season or exceeded. This is particularly relevant with respect to darkblotched rockfish, Pacific ocean perch, and widow rockfish. Given that these species are primarily caught incidentally in trawl fisheries, concerns of increased encounters are most notable for those fleets. Furthermore, the proposed management measures under all action alternatives bring about impact estimates at or just below the proposed OY for Pacific ocean perch (Tables 2-14, 2-19 and 2-21). Without an excess of allowable impacts to buffer against the uncertainty associated with a biomass near a rebuilt level, there is a risk under each action alternative that the Pacific ocean perch OY could be exceeded. A similar situation may occur under Action Alternative 1 with respect to widow rockfish, as there is only a very small residual (3% of OY or 3.8 mt). In the scorecards that explore the different allocation scenarios (Tables 4-43 through 4-50), the residual is maintained for these three depleted species under the high OY scenario. Under the low OY scenarios, there is no residual for any of these depleted species.

Second, as the discard estimates from WCGOP improve, it is likely that discard rates used to manage those fisheries with a lesser amount of at-sea observations (i.e., southern limited entry and open access fixed gear fisheries) will change dramatically. This is a particular concern if new discard rates prove to be much higher than currently assumed based on limited at-sea observations. As this information is used to better inform managers about catch of depleted species, inseason action may be necessary to correct management measures that had been crafted according to current discard rates.

Variability in a stock's recruitment success is another source of uncertainty (see section 4.4.2.1). Such variability is most common among winter-spawning shelf and slope groundfish, such as bocaccio, lingcod, and Pacific whiting. For these species, improved population trajectories over recent years can be aligned with climate shifts; for other species, such as cowcod and widow, the improvement in population trends is primarily due to deterministic recruitment trends and reduced harvest rates. The uncertainty surrounding the recruitment success of these species may provide additional support for managing fishing impacts to a value lower than the OY.

The considerations discussed above bring about a cumulative risk of exceeding the OY for certain depleted species. Much of this risk can be attributed to numerous sources of uncertainty, which are discussed further in section 4.2.

General Action Alternative 1 Considerations

The management measures proposed in Action Alternative 1 all constrain fisheries below the Council preferred low OYs for depleted species (Table 2-14). However, for some species (i.e., Pacific ocean perch, widow rockfish, and bocaccio), there is little or no residual available to managers to buffer against uncertainty.

Under these low OYs, the Council must evaluate whether viable fisheries can be maintained. If it is determined that the management measures under Action Alternative 1 do not allow for viable fisheries, then other allocation scenarios may be considered by the Council (see discussion in 4.5.2.2 on allocating the entire OYs to the recreational fishery or to the commercial fishery).

The Council preferred low OYs bring about a similar situation to what is portrayed under Rebuilding Alternative 5. Under both of these, the management measures could result in fisheries that are equally constrained by most, if not all, of the depleted species' OYs. Though this suggests the need for additional room to buffer against management uncertainty, this is countered against the severe social and economic consequences that would be made even more acute by managing to a mortality impact lower than the OY.

General Action Alternative 2 Considerations

The management measures proposed in Action Alternative 2 are projected to constrain the depleted species impacts of all fisheries to levels that are intermediate between the Council preferred low and high OYs (Table 2-19). For some species (i.e., bocaccio, cowcod, and widow rockfish) under this action alternative, there is a large difference between the projected impacts and the high OY alternative. For Pacific ocean perch, on the other hand, the projected impact is nearly equal to the Council preferred high OY value. Unlike Action Alternative 1, this alternative allows for the higher values of research impacts for all depleted species.

General Action Alternative 3 Considerations

The management measures proposed in Action Alternative 3 are projected to constrain the depleted species impacts of all fisheries to levels at or below the Council preferred high OYs (Table 2-21). The anticipated impact to Pacific ocean perch, however, is equal to the high OY under this alternative. This alternative allows for the higher values of research impacts for all depleted species.

4.5.4.1 Limited Entry Trawl Impacts

The estimated impacts of the non-whiting limited entry trawl sector on depleted species and on target species under the action alternatives are displayed in Table 4-52. In 2005 a new management measure was implemented mandating the use of selective flatfish trawls shoreward of the trawl RCA north of 40°10' N latitude; Table 4-53 projects impacts to depleted and target species that would be expected if selective flatfish trawl gear were used by vessels south of 40°10' N latitude.

Table 4-52. Estimates of impacts (mt) to depleted species and total target catch associated with the limited entry non-whiting trawl fishery under the alternatives, without use of selective flatfish trawl gear in the south.

		No Action	Action Alternative 1			Action Alternative 2			Action Alternative 3		
		Total	North	South	Total	North	South	Total	North	South	Total
Depleted species	Canary	7.8	2.5	1.2	3.7	4.4	3.1	7.5	5.4	3.1	8.5
	POP	63.3	32.4	0.0	32.4	85.6	0.0	85.6	85.9	0.0	85.9
	Darkblotched	160.3	49.5	17.2	66.7	133.7	45.9	179.6	135.1	45.9	181.1
	Widow	1.0	0.1	0.0	0.1	1.0	0.1	1.0	1.0	0.1	1.0
	Bocaccio	47.4	0.0	9.1	9.1	0.0	50.5	50.5	0.0	50.5	50.5
	Yelloweye	0.3	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
	Cowcod	2.7	0.0	0.2	0.2	0.0	2.9	2.9	0.0	2.9	2.9
Target species	Sablefish		1,269	431	1,700	1,779	558	2,337	1,798	558	2356.0
	Longspine		171	335	507	178	577	756	178	577	755.5
	Shortspine		304	268	572	597	376	973	598	376	974.2
	Dover		3,266	891	4,157	8,352	2,458	10,809	8,407	2,458	10865.1
	Arrowtooth		1,311	19	1,330	5,192	51	5,243	5,117	51	5168.1
	Petrale		1,403	256	1,659	2,078	369	2,447	2,092	369	2460.8
	Other Flatfish		197	334	531	623	694	1,317	626	694	1319.7
	Slope Rockfish		113	209	322	173	351	523	173	351	523.5

Table 4-53. Estimates of impacts (mt) to depleted species and total target catch associated with the limited entry non-whiting trawl fishery under the alternatives, with use of selective flatfish trawl gear in the South.

		Action Alternative 1			Action Alternative 2			Action Alternative 3		
		North	South	Total	North	South	Total	North	South	Total
Depleted Species	Canary	2.5	0.9	3.4	4.4	2.4	6.8	5.4	2.4	7.8
	POP	32.4	0.0	32.4	85.6	0.0	85.6	86.0	0.0	86.0
	Darkblotched	49.5	17.2	66.7	133.7	45.9	179.6	135.1	45.9	181.1
	Widow	0.1	0.0	0.1	1.0	0.1	1.0	1.0	0.1	1.0
	Bocaccio	0.0	9.1*	9.1	0.0	50.5*	50.5	0.0	50.5*	0.0
	Yelloweye	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
	Cowcod	0.0	0.2*	0.2	0.0	2.9*	2.9	0.0	2.9*	0.0
Target Species	Sablefish	1,269	431	1,700	1,779	558	2,337	1,798	558	2356.0
	Longspine	171	335	507	178	577	756	178	577	755.5
	Shortspine	304	268	572	597	376	973	598	376	974.2
	Dover	3,266	891	4,157	8,352	2,458	10,809	8,407	2,458	10865.1
	Arrowtooth	1,311	19	1,330	5,192	51	5,243	5,117	51	5168.1
	Petrale	1,403	256	1,659	2,078	369	2,447	2,092	369	2460.8
	Other Flatfish	197	334	531	623	694	1,317	626	694	1319.7
	Slope Rockfish	113	209	322	173	351	523	173	351	523.5

Note: * indicates that differences in bycatch for these species may occur, but the degree of change is unknown

The bycatch analysis for the Pacific whiting trawl fishery (Table 4-54) assumes that the total US Pacific whiting catch will decrease in accordance with the allowable impacts to depleted species. An alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

Table 4-54. Estimates of impacts to depleted species and total target catch associated with the Pacific whiting fishery under the alternatives.

Action Alternatives	Total US Catch (mt)	Sector	Allocation (mt)	Impact to depleted species (mt)				
				Canary	Darkblotched	POP	Widow	Yelloweye
No Action		Tribal		1.6	0.0	1.0	6.1	-
		Mothership			4.7	2.9		0.0
		CP		4.7	6.3	1.8	200.0	0.0
		Shoreside			5.2	0.6		0.0
		Total		6.3	16.2	6.3	206.1	0.0
Alternative 1	150,000	Tribal	25,000	1.1	0.0	0.5	4.3	-
		Mothership	29,520	1.8	2.5	0.5	15.3	0.0
		CP	41,820	0.4	3.3	1.6	26.5	0.0
		Shoreside	51,660	0.7	2.8	0.9	22.6	0.0
		Total		4.0	8.6	3.5	68.7	0.0
Alternative 2	200,000	Tribal	27,500	1.2	0.0	0.5	4.8	-
		Mothership	40,920	2.5	3.4	0.7	21.2	0.0
		CP	57,970	0.5	4.6	2.2	36.8	0.0
		Shoreside	71,610	1.0	3.8	1.3	31.3	0.0
		Total		5.2	11.9	4.7	94.0	0.0
Alternative 3	260,000	Tribal	35,000	1.6	0.0	0.6	6.0	-
		Mothership	53,520	3.2	4.5	0.9	27.7	0.0
		CP	75,820	0.7	6.0	2.8	48.1	0.0
		Shoreside	93,660	1.3	5.0	1.7	41.0	0.0
		Total		6.8	15.5	6.1	122.8	0.0

4.5.4.2 Limited Entry Fixed Gear Impacts

Sablefish Alternatives

The impacts associated with the action alternatives for sablefish (Table 4-55) are arrayed by A) holding the allocations for sablefish constant for the limited entry and open access fixed gear sectors under the Council's preferred sablefish OY and moving the fixed gear RCA line north of 40°10' N latitude from 100 to 125 and 150 fm respectively, and B) by lowering the OY for sablefish to achieve the same reductions in bycatch as by moving the fishery in the north out to the 125 fathom line and the 150 fathom line. These results show that savings in bycatch are achieved by advancing the line further seaward, or by lowering the sablefish allocation to these sectors, but either case creates an economic cost to sablefish fishers.

A review of West Coast groundfish observer data shows that sablefish vessels currently fish at depths deeper than 150 fm north of 40 degrees 10 minutes latitude, but for vessels that homeport in the Puget sound region of Washington, a 150 fathom line eliminates their fishing areas and would require vessels to fish substantially further south and further out to sea. This is because the shelf and slope areas off northern Washington are comprised of multiple canyons and broad areas with relatively the same depth. In other areas of the coast the bottom depths get deeper in a more continuous fashion as one moves further out to sea. Those vessels that don't home port in the Puget sound region and that currently don't fish at depths outside of 150 fm would need to travel further out to sea, however the additional distance required of these vessels to fish outside 150 fm is minor compared to vessels that home port in the Puget sound area.

Reducing the sablefish allocation is shown to give a comparison between area closures and reductions in target species catch that would achieve the same levels of bycatch. Reducing the sablefish allocation for these sectors would decrease bycatch because vessels would fish less and thereby exert less effort on the areas where overfished species are found. While reducing the sablefish allocations for limited entry and open access fixed gear vessels would decrease the catch and revenues to these vessels, it would allow vessels to fish closer to shore and decrease the cost of accessing that sablefish when compared to imposing fathom restrictions that achieve the same reductions.

Table 4-55. Impact estimates associated with all fixed gear sablefish fisheries.

	Council Preferred Sablefish OY with Changes in Fathom Line			Reduced OY with Constant Fathom Line	
	Action Alt. 1	**Action Alt. 2**	**Action Alt. 3**	**Action Alt. 2b**	**Action Alt. 1b**
	150 North: 150 South[3]	125 North: 150 South[2]	100 North: 150 South[1]	100 North: 150 South[1]	100 North: 150 South[1]
Total catch OY (mt)	5934	5934	5934	4450	2225
Landed Catch (mt)	2411	2411	2411	1800	885
Projected impacts (mt)					
Widow rockfish	0.00	0.00	0.02	0.01	0.01
Canary rockfish	0.13	0.39	0.57	0.43	0.21
Yelloweye rockfish	0.47	0.96	1.28	0.96	0.47
Bocaccio rockfish	0.00	0.00	0.00	0.00	0.00
Cowcod rockfish	0.00	0.00	0.00	0.00	0.00
Pacific ocean perch	0.27	0.36	0.29	0.22	0.11
Darkblotched rockfish	1.23	0.94	0.80	0.60	0.29

[1]Seaward boundary of RCA at 100 fm North of 40°10' and at 150 fm South of 40°10'

[2]Seaward boundary of RCA at 125 fm North of 40°10' and at 150 fm South of 40°10'

[3]Seaward boundary of RCA at 150 fm North of 40°10' and at 150 fm South of 40°10'

Impacts associated with the non-sablefish limited entry fixed gear sector (primarily targeting spiny dogfish and Pacific halibut) are displayed in Table 4-56.

Table 4-56. Impact estimates associated with the limited entry fixed gear sector (non-sablefish).

		Alternatives			
		No Action	Action Alt. 1	Action Alt. 2	Action Alt. 3
Impact to Depleted Species (mt)	Canary	0.2	0	0.1	0.2
	Darkblotched	0.4	0.4	0.4	0.4
	POP	0	0	0	0
	Widow	0.5	0.5	0.5	0.5
	Yelloweye	1.3	0.2	0.6	1.3
Impact to Target Species (lbs)	Spiny dogfish	530,211	150,268	262,667	530,211
	Pacific halibut	923,295	249,290	923,295	923,295

4.5.4.3 Open Access Impacts

Like with the limited entry fixed gear fisheries, the primary means to constrain impacts of the open access sector on depleted species is by changing the non-trawl RCA boundaries. The specific impacts under each of the action alternatives have been quantitatively assessed for only some portions of this diverse sector, however. Table 4-56 depicts the projected impacts for all sablefish fisheries (limited entry and open access) and section 4.5.4.3 discusses the impacts of the open access nearshore commercial fisheries.

4.5.4.4 Nearshore Commercial Impacts

Table 4-57 depicts the estimated total mortality of nearshore commercial fisheries under each action alternative. The management measures proposed within Action Alternative 3 are the same as the No Action alternative, and therefore the estimated impacts for these two alternatives are equal. Under the most restrictive management measures (Action Alternative 1), the catch of black rockfish north of 40°10' N latitude is projected to drop by 60% from status quo, while the catch of other target species is projected to be maintained at SQ levels. South of 40°10' N latitude catch of shallow and deeper nearshore species, cabezon, and kelp greenling under Action Alternative 1are all expected to reduce by about 15% due to the proposed area and depth restrictions.

Table 4-57. Open access nearshore commercial fisheries' estimated total mortality (mt) and its percent reduction from status quo under each alternative.

		No Action	Action Alt. 1		Action Alt. 2		Action Alt. 3	
		Mortality (mt)	Mortality (mt)	Reduction (%)	Mortality (mt)	Reduction (%)	Mortality (mt)	Reduction (%)
South of 40 10, North of 34 27	Canary	0.28	0.26	21%	0.30	7%	0.28	0%
	Shallow nearshore species	47	47	16%	55	1%	47	0%
	Deeper nearshore species	42	40	17%	47	3%	42	0%
	Cabezon	29	39	15%	46	0%	29	0%
	Kelp Greenling	1.0	3.0	15%	3.0	0%	1.0	0%
North of 40 10	Canary	1.83	0.72	56%	1.17	29%	1.83	0%
	Yelloweye	2.41	0.81	62%	1.32	38%	2.41	0%
	Widow	0.08	0.03	53%	0.05	24%	0.08	0%
	Black Rockfish	170	70	60%	158	10%	170	0%
	Blue Rockfish	11	10	1%	10	1%	11	0%
	Other minor nearshore rockfish	36	10	0%	10	0%	36	0%
	Cabezon	33	31	0%	31	0%	33	0%
	Kelp Greenling	21	23	0%	23	0%	21	0%
Depleted Species Total	Canary	2.11	0.98	50%	1.47	25%	2.11	0%
	Yelloweye	2.41	0.81	62%	1.32	38%	2.41	0%
	Widow	0.08	0.03	53%	0.05	24%	0.08	0%

4.5.4.5 Tribal Fishery Impacts

Table 4-58 depicts the projected impacts to the depleted and target species associated with all tribal groundfish fisheries. The estimated impacts to depleted species are the same across all action alternatives (and are the same as the No Action alternative).

The projected catch of spiny dogfish is significantly higher under the action alternatives than under no action. The Makah Tribe is proposing a directed longline fishery for spiny dogfish for 2007 and 2008. The fishery would be restricted to the Limited Entry trip limits. Increased landings of dogfish by treaty fishermen in 2007 and 2008 would be dependent on successful targeting in 2006 while staying within current estimates of impacts on overfished species. The projected value for spiny dogfish landings in Table 4-58 (600,000 lbs or 272.2 mt) is a placeholder provided by Makah Fisheries Management; impacts will not be known until the test fishery is prosecuted. In addition, flatfish and rockfish impacts under all action alternatives are expected to increase by 25% due to increased effort (though not capacity) in Makah trawl fisheries.

Table 4-58. Estimates of impacts to species associated with the Tribal fishery under the alternatives.

		Alternatives			
		No Action	Action Alt. 1	Action Alt. 2	Action Alt. 3
Impact to depleted species	Canary rockfish	3.4	3.4	3.4	3.4
	Darkblotched rockfish	0.1	0.1	0.1	0.1
	Widow rockfish	40.0	40.0	40.0	40.0
	Yelloweye rockfish	2.3	2.3	2.3	2.3
Impact to non-depleted species	Pacific whiting	34,357	25,000	27,500	35,000
	Sablefish	719.4	561.4	561.4	561.4
	Yellowtail rockfish	539.4	539.4	539.4	539.4
	Flatfish spp.	446.7	558.4	558.4	558.4
	Pacific Cod	400.0	400.0	400.0	400.0
	Spiny dogfish	5.9	272.2	272.2	272.2
	Lingcod	29.8	29.8	29.8	29.8
	Skate spp.	23.2	23.2	23.2	23.2
	Unspecified rockfish				
	Slope rockfish	28.6	28.6	28.6	28.6
	Near-shore rockfish	0.2	0.2	0.2	0.2
	Shelf rockfish	9.3	9.3	9.3	9.3
	Walleye pollock	19.6	19.6	19.6	19.6
	Shortspine thornyhead	10.8	13.5	13.5	13.5
	Longspine thornyhead	0.2	0.2	0.2	0.2

4.5.4.6 Washington Recreational Impacts

Management measures proposed under the action alternatives serve to constrain the Washington recreational fishery to impacts on canary rockfish and yelloweye rockfish lower than those under the No Action alternative (Table 4-59).

Table 4-59. Estimates of impacts to depleted species associated with the Washington recreational fishery under the alternatives.

			Alternatives			
			No action	**Action Alt. 1**	**Action Alt. 2**	**Action Alt. 3**
Depleted species impacts (mt)	Canary	North Coast	1.4	0.5	0.6	1.1
		South Coast	0.2	0.2	0.2	0.2
		Columbia	0.0	0.0	0.0	0.0
		Total	1.6	0.7	0.8	1.4
	Yelloweye	North Coast	3.2	1.2	1.4	2.5
		South Coast	0.5	0.4	0.4	0.5
		Columbia	0.0	0.0	0.0	0.0
		Total	3.8	1.5	1.8	3.1

4.5.4.7 Oregon Recreational Impacts

Management measures proposed under the action alternatives serve to constrain the Oregon recreational fishery to depleted species impacts lower than those under the No Action alternative (Table 4-60). These measures also restrict the catch of target species (with the exception of lingcod), which are projected to be equal or lower to No Action levels under all alternatives.

Table 4-60. Estimates of impacts to depleted species and to target species associated with the Oregon recreational fishery under the alternatives.

			No action	Action Alternatives				
				1a	1b	2	3a	3b
Impact to depleted species (mt)		Yelloweye	3.6	1.6	1.5	1.9	2.5	2.9
		Canary	5.3	1.6	2.3	2.6	3.7	4.0
		Widow	1.6	0.1	0.1	0.1	0.4	0.6
Impact to target species (mt)	**Other nearshore rockfish species complex**	Blue	34.1	20.8	27.6	30.7	30.9	30.9
		Brown	0.1	0.1	0.1	0.1	0.1	0.1
		China	2.2	2.1	1.9	1.9	2.0	2.0
		Copper	4.9	4.4	4.5	4.5	4.6	4.6
		Grass	1.4	1.3	1.3	1.3	1.3	1.3
		Quillback	3.3	3.6	3.0	2.9	2.9	2.9
		Total	45.9	32.3	38.4	41.4	41.7	41.7
		Black rockfish	328.7	308.1	294.1	293.7	294.2	294.2
		Vermilion rockfish	6.8	6.8	6.0	6.0	6.1	6.1
		Tiger rockfish	0.2	0.2	0.2	0.2	0.2	0.2
		Lingcod (2007)	209.2	141.8	199.1	192.4	225.1	230.0
		Lingcod (2008)	244.7	164.2	231.3	223.9	262.7	267.9
		Cabezon	19.1	17.8	17.2	17.3	17.3	17.3
		Kelp greenling	19.4	19.4	18.9	19.0	19.0	19.0
		Rock greenling	2.2	2.2	2.2	2.2	2.2	2.2

4.5.4.8 California Recreational Impacts

Table 4-61 depicts the projected impacts to depleted species under the action alternatives associated with the California recreational fisheries. Table 4-62 provides projected impacts to target species under the action alternatives.

Table 4-61. Estimates of impacts to depleted species associated with the California recreational fishery under the alternatives.

		Impact to depleted species (mt)				
Alternatives		**Bocaccio**	**Canary**	**Cowcod**	**Widow**	**Yelloweye**
No Action	Total	98.0	9.3	0.4	8.0	3.7
Action Alt. 1	North region	N/A	0.5	N/A	0	0.8
	North Central	0.2	3	0	1.3	0.4
	S. Central - Monterey	1.8	0.3	0	0.1	0
	S. Central - Morro Bay	0.5	0.7	0	0	0
	South Region	13.4	0.3	0	0.2	0
	Total	15.9	4.8	0	1.6	1.2
Action Alt. 2	North region	N/A	0.7	N/A	0	0.9
	North Central	0.2	3.8	0	2.0	0.6
	S. Central - Monterey	1.8	0.3	0	0.1	0
	S. Central - Morro Bay	0.6	0.8	0	0	0
	South Region	29.1	0.3	0.1	1.1	0
	Total	31.7	5.9	0.1	3.2	1.5
Action Alt. 3	North region	N/A	0.7	N/A	0	0.7
	North Central	1.0	5.7	0	12.1	0.5
	S. Central - Monterey	12.0	0.6	0	1.0	0.0
	S. Central - Morro Bay	3.9	1.3	0	0	0.1
	South Region	89.9	0.3	0.3	5.2	0
	Total	106.8	8.6	0.3	18.3	1.3

Table 4-62. Estimates of impacts to target species associated with the California recreational fishery under the alternatives.

Alternatives		Impact to target species (mt)				
		Minor Nearshore Rockfish North	Minor Nearshore Rockfish South	CA Scorpion-fish	Lingcod	Lingcod + Dec Open (except SCMB)
Action Alt. 1	North region	17.1	N/A	0	51	55
	North Central	N/A	126	0	105	120
	S. Central - Monterey	N/A	98	0	26	29
	S. Central - Morro Bay	N/A	81	0	21	21
	South Region	N/A	58	79	22	29
	Total	17.1	363	79	225	254
Action Alt. 2	North region	17.3	N/A	0	51	55
	North Central	N/A	162	0	135	151
	S. Central - Monterey	N/A	98	0	26	29
	S. Central - Morro Bay	N/A	87	0	23	23
	South Region	N/A	57	74	24	33
	Total	17.3	404	74	259	291
Action Alt. 3	North region	14.8	N/A	0	42	46
	North Central	N/A	147	0	120	133
	S. Central - Monterey	N/A	114	0	29	32
	S. Central - Morro Bay	N/A	79	0	21	21
	South Region	N/A	61	75	28	37
	Total	14.8	401	75	240	269

7.0 SOCIOECONOMIC

7.1 Affected Environment

7.1.1 Introduction

The Pacific Coast groundfish fishery is a multi-species fishery (over 90 groundfish species) taking place off the coasts of Washington, Oregon, and California where groundfish are harvested as target catch or indirectly as bycatch in other fisheries. Groundfish fishermen themselves participate in other fisheries as well. These other fisheries include salmon, highly migratory species, coastal pelagic species, shrimp, and crab, amongst others. All of these fisheries contribute to a wide range of commercial, recreational, and tribal activities that have economic, social, and cultural significance to those engaged in harvesting fish resources. Fish buyers and processors, suppliers of commercial and recreational fishing equipment and services, and fishing communities depend on these fisheries. The aim of this chapter is to describe these activities and relate them to the conservation and management measures being proposed, particularly in the context of the effects of reducing the bycatch of the seven overfished species. Information will also be provided that relates to another FMP objective of maintaining year-round groundfish fishing.

The information and organization of this discussion of the socio-economic environment draws upon the following documents—in many instances repeating or summarizing the relevant information, and, in other instances, updating the information provided:

> The Groundfish EFH document {NMFS (National Marine Fisheries Service) 2005. Pacific Coast Groundfish Fishery Management Plan, Essential Fish Habitat Designation and Minimization of Adverse Impacts, Final Environmental Impact Statement. National Marine Fisheries Service, Seattle, WA, December 2005},
>
> The Bycatch EIS {NMFS (National Marine Fisheries Service), the Pacific Coast Groundfish Fishery Management Plan, Bycatch Mitigation Final Environmental Impact Statement, NMFS, Seattle, WA, September 2004}
>
> The final EIS for the 2005-06 specification document {PFMC (Pacific Fishery Management Council) 2004. Final Environmental Impact Statement for the Proposed Groundfish Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-06 Pacific Coast Groundfish Fishery. Pacific Fishery Management Council. Portland, OR, October 2004.}
>
> The analyses and concepts developed for assessing the needs of fishing communities that were presented at the April 2006 Council meeting {Agenda F.1 Groundfish Item F.1 Supplemental Attachments 6-8)}

7.1.1.1 Management Context

The industry and community descriptions and impact analyses found in this chapter are shaped by the typical analyses undertaken to address the setting of harvest quotas and associated management measures, but also by the recent ruling of the Ninth Circuit Court of Appeals concerning rebuilding plans for overfished species. Therefore, it will be useful to summarize the basic context of the current FMP and the important directions for management provided by the Ninth Circuit.

Current FMP

The Council allocates harvest specifications (OYs) between the limited entry and open access categories. Most of the Pacific coast commercial groundfish harvest is taken by the limited entry fleet. Commercial harvest rates of groundfish are constrained by annual harvest guidelines, two-month or one-month cumulative period landing limits, individual trip limits, size limits, species-to-species ratio restrictions, area closures, and other measures. This program is designed to control effort so that the allowable catch is taken at a slow enough rate to stretch the season over the full year. Cumulative period catch limits are set by comparing current and previous landings rates with the year's total available catch and predicted participation

The groundfish limited entry program applies to bottom and midwater trawl, longline, and trap (or pot) gears. Each limited entry permit is endorsed for a particular gear type and that gear endorsement cannot be changed, so the distribution of permits among gear types has been fairly stable. Each permit also has a vessel length endorsement. The total number of permits has typically changed only when multiple permits have been combined to create a new permit with a longer length endorsement. However, in December 2003, a buyback program permanently retired 91 trawl permits, roughly 35% of the total. Limited entry permits can be sold and leased out by their owners, so the distribution of permits among the three states often shifts. At the beginning of 2003, roughly 39% of the limited entry permits were assigned to vessels making landings in California, 37% to vessels making landings in Oregon, and 23% to vessels making landings in Washington.

Other non-tribal commercial fisheries, which either target groundfish or catch them incidentally, but do not hold groundfish limited entry permits, are considered "open access." Gears used by participants in open access commercial fisheries include longline, vertical hook-and-line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl gears. Open access trawl gear may not target groundfish, but may land incidental groundfish caught while targeting other species. Open access trap/pot and longline vessels may target groundfish under certain restrictions. Open access vessels may possess limited entry licenses for other, state-managed nongroundfish fisheries such as pink shrimp or Dungeness crab.

Members of the Makah, Quileute, Hoh, and Quinault tribes participate in tribal commercial, ceremonial and subsistence fisheries for groundfish off the Washington coast according to their treaty rights. Participants in the tribal commercial fishery use similar gear to non-tribal commercial fishers who operate off Washington, and groundfish caught in the tribal commercial fishery is typically sold through the same markets as non-tribal commercial groundfish catch. There are set tribal allocations for sablefish and Pacific whiting, while the other groundfish species' allocations are determined through the Council process in coordination with the tribes, states, and NMFS. Management of tribal fisheries is done by the individual tribes in accordance with their tribal practices.

In addition to commercial and tribal fisheries, there are recreational fisheries associated with the groundfish fishery. Marine recreational fisheries consist of charter vessels, private vessels, and shore anglers. Charter vessels are larger vessels for hire, which typically can fish farther offshore than most vessels in the private recreational fleet. Shore-based anglers often fish in intertidal areas, within the surf, or off jetties. Recreational fisheries are managed by a series of seasons, area closures, and bag limits.

Ninth Circuit

Since 2000, the management of West Coast groundfish fisheries has been heavily centered on the need to rebuild overfished groundfish species. A species is considered overfished when its biomass is below 25% of its estimated unfished biomass level. West Coast groundfish stocks are highly inter-mixed, meaning that overfished species co-occur and are caught in common with more abundant groundfish stocks. This inter-mixed nature of groundfish stocks means that eliminating the directed targeting of overfished species usually does not achieve the catch reductions needed to meet rebuilding goals. To adequately constrain total catch of overfished species, management must also constrain targeted fishing on healthy stocks that co-occur with overfished species in order to reduce incidental overfished species catch. This need to constrain harvest of healthy stocks has economic implications to sectors and communities engaged in fish harvesting and processing, because of the loss in landings and revenue that could have been derived from both overfished species and many target species that co-occur with those overfished species. The reader is referred to Chapter 2 Table 2-1 for a full presentation of the levels of overfished species and target species being considered in this EIS along with the relevant associated conservation and management measures that exist to constrain harvests so that these levels are not exceeded as well to equitably distribute the burden of conservation and management across the various harvest groups. These user groups are listed in tables such as Table 2-4, which are otherwise frequently referred to as Bycatch Scorecards."

According to the Magnuson-Stevens Fishery Conservation and Management Act, when a fishery is overfished, any fishery management plan, amendment, or proposed regulations shall:

A) *specify a time period for ending overfishing and rebuilding the fishery that shall—*
   i) *be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem; and*
   ii) *not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise;*

B) *allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery*

As indicated in Chapter 2 (Section 2.1.1), in response to the August 2005 ruling by the Ninth Circuit Court of Appeals, the Council though this EIS is reconsidering its rebuilding plans for all overfished species to ensure they comply with the MSA as interpreted by the Court. The Court's interpretation of the rebuilding requirements of the MSA can be summarized to include the following directions: 1) the rebuilding periods must be as short as possible; 2) that short-term needs of fishing communities may be taken into account in setting rebuilding periods; and 3) to avoid disastrous short-term consequences, limited quotas may be set that allow for some fishing of plentiful species, despite the inevitability of bycatch.

For purposes of assessing the needs of fishing communities, the Council adopted the following general definition at its April 2006 meeting: DBD—need to check language against the actual motion:

> Fishing Communities need a sustainable fishery that is safe, well managed, and profitable, that provides jobs and incomes, that contributes to the local social fabric, culture, and image of the community, and helps market the community and its services and products.

Therefore, in comparison, to previous EISs undertaken for the Pacific Groundfish Fishery Management Plan, this chapter where appropriate, in addition to the typical approaches undertaken, will provide more detailed and focused socio-economic information and analyses relating to rebuilding species and fishing communities.

Overview of General Trends

In addition to the management context, it is important to understand the fisheries context that underlies the determination of the conservation and management measures being developed through this EIS. For purposes of discussion, the Groundfish Fishery will be described in terms of overall landings as a means of describing recent trends and for describing alternative ways that various groundfish sectors are classified. As groundfish fishermen fish in fisheries other than groundfish and groundfish communities depend on other fisheries as well, it is also important to the groundfish fishery in relation to other West Coast fisheries.

Groundfish Fishery

Harvest Sectors and Sub-sectors, Landings and Revenues

As discussed above, the Groundfish fishery is made up by many components. Table 7-1 shows sector trends in harvests from 1995 to 2004. These components are often summed in various ways depending on the management issue. For example, the non-tribal whiting fishery is comprised of three sectors—At-sea catcher processors, at-sea motherships, and shoreside whiting limited entry trawl. The total whiting fishery is made up of the non-tribal whiting sector and the tribal shorebased and at-sea whiting fisheries. Shorebased landings can be estimated by summing Shoreside Whiting Limited Entry Trawl, Shorebased Non-Whiting Limited Entry Trawls, Shoreside Limited Entry Line Gear, Shoreside Limited Entry Pot Gear, Shoreside Directed Open Access, and Shoreside Incidental Open Access landings. Throughout the remainder of this chapter, the discussion will involve one or more of these components.

Some trends should be noted. For this period, whiting harvests by the at-Sea catcher processors and shoreside whiting limited entry trawl fisheries reached a peak in 2004. Tribal shoreside landing also reached a peak in 2004 of 8,698 tons reflecting the recent introduction of a new shorebased tribal whiting fishery. Tribal whiting fisheries were first instituted in 1996 with advent of the at-sea tribal fishery. Harvests by shoreside non-whiting fishery limited entry trawl fleet and recreational fleets reached their lowest levels in 2004 a harvests. When combined, all non-whiting and non-tribal sectors reached a period low of commercial shoreside sectors by the shoreside non-whiting limited entry trawl fleet were at their lowest as was the recreational catch. As Pacific whiting is a highly variable species, often times analysts focus on the non-tribal commercial shoreside landings other than whiting. When this is done, landings shoreside by non-whiting non-tribal commercial sectors also reached a low in 2004, approximately 25,000 tons compared with the 59,000 and 60,000 tons of landings in 1995 and 1996, respectively. The decline in such landings mirrors status of the stocks and Council efforts to rebuild overfished species.

Table 7-1 also shows the percentage shares of each sector of the total fishery. In terms of total non-whiting-non-tribal harvests, there has been a small decline in non-whiting limited entry trawl share from past levels of greater than 75% to the current level of 71%. This has been matched by a slight increase in the recreational share, from 4% to 5% in 1995 and 1996 respectively to current levels of 7 and 8 percent. (The sharp temporary increases in recreational harvests in 1998 and 2003 are due to increases in Central and Northern California recreational harvests of lingcod, widow rockfish, and rockfish contained in the category "minor rockfish south.)

Tables 7-2a, 7-2b, and 7-2c list 1981 through 2005 commercial landings by round weight, exvessel revenue in current dollars, and exvessel revenue in inflation-adjusted dollars for commercially important species on the West Coast. These tables echo the trends discussed above but from a more historical perspective. Table 7-2a shows the large volume of Pacific whiting landings and the emergence of shore-based processing in the early 1990s. (Note that the at-sea sector includes joint venture fisheries occurring in the 1980s. "Americanization" ultimately replaced foreign processors with domestic ones.) While total groundfish landings peaked in 1994, landings of species other than whiting continued a long-term declining trend during this period. Total groundfish landings measured by weight peaked in 1994 at 305,312 mt and have declined by nearly half since. Flatfish, sablefish, and rockfish landings all peaked in 1982, the first full year under Groundfish FMP management. (Note that some decline in landings is to be expected as standing stocks are "fished down" to MSY biomass.) Landings in all groundfish species categories declined steeply after 1998, when species began to be designated overfished. Rockfish landings fell by about three-quarters from 1998 to 2002.

Table7-2b shows total groundfish exvessel value peaking in 1997 at $101.2 million, three years after the peak in total groundfish landings. The difference between these trends is partly explained by the observed run up in exvessel prices for sablefish between 1994 and 1997 at a time when total sablefish landings were pretty stable. Total exvessel value of groundfish landings declined 43% to about $58 million in 2003.

Table 7-2c adjusts the values in Table 7-2b for inflation, allowing a more direct comparison of the real value of landings between years. Low-value whiting is a much less prominent component of landings when measured this way. Measured in constant 2005 dollars, the change in the value of rockfish landings between 1998 and 2003 fell by more than two thirds. The inflation-adjusted value of sablefish and flatfish landings remained fairly stable during this period. Measured in constant 2003 dollars, total groundfish landings value was greatest in the late 1980s, peaking in 1989 at almost $132 million. By 2003, the inflation adjusted value of total groundfish landings had fallen by more than half.

Whiting harvests reached an all time high in 2005 at about 260,000 tons whereas for the other groundfish species there are significant declines starting in 1998 with 2005 showing very slight increases in harvests compared to 2004. In terms of ex-vessel revenues, since the whiting fishery was at an all time high, total groundfish revenues showed an increase significant increase in 2005 to $73 million which is still below the 1981-1997 average of $115 million. (Note that whiting and the other categories include tribal harvests.) In terms of non-whiting groundfish revenues, 2005 showed a slight increase over 2004 to $43 million due to increased sablefish revenues but is still below the 1981-1997 inflation adjusted average of $91 million. (1981-1997 is used as a basis of comparison because the downward trends in lingcod and rockfish started their sharp declines in 1998 and thus the beginning of rebuilding efforts.)

Groundfish Fishery In Relation to Other West Coast Fisheries

Tables 7-2.a through 7-2.c also show the other west coast fisheries harvests and revenues.

Total west coast harvests reached 440,000 tons in 2005 worth $281 million. Of these amounts, groundfish fisheries accounted for 50% of the harvests and 25% of the revenues. In terms of total exvessel revenues, Dungeness Crab was the only fishery that had higher revenues in 2005. Note that squid was the only major fishery that had a significant increase as the Dungeness Crab, salmon, and HMS fisheries all had significant declines in 2005 compared to 2004 adding up to a total West Coast decline in non-groundfish revenues of about 12%. Declines in non-groundfish fisheries make groundfish communities, who are already facing declining groundfish revenues, more vulnerable while often leading to increase effort in groundfish fisheries. As described below, many of these non-groundfish fisheries are part of the groundfish "open access" fleets. (As most of these fisheries are "shoreside fisheries" see 7.1.2.1 for additional discussion.)

Bycatch and Fisheries

Table 7-3 shows for these sectors or their subcomponents, the various bycatch associations; To identify likely distributional affects of reductions in overfished species mortality, NMFS Northwest Region working with members of the GMT constructed a relational database. This database used available data on the interaction of fishery sectors with overfished species, and historical management actions that have been taken to achieve management targets of overfished species. Information from the 2005 groundfish stock assessments was used to identify the distributional range of various overfished species, and then analyzed in conjunction with the size of fishing sectors on a regional basis. The resulting combined effect of relative stock size and relative fleet size helps identify the risk that a regional component of a fishing sector poses to a stock of an overfished species. In this case, "risk" is the potential catch that a particular regional sector has the potential to attain relative to the OY and relative to the capability of other sectors operating in the same area. Using this information on the relationship of groundfish stock and fleet sizes, a data set was constructed that identifies sectors that have high, med-high, med-low, and low or no impact on each overfished species, within a coastwide series of latitude-bounded management areas. Fishing sectors that were analyzed include:

1. limited entry bottom trawl – deep
2. limited entry bottom trawl –shelf
3. limited entry midwater trawl – Pacific whiting
4. limited entry fixed gear – sablefish
5. limited entry fixed gear – nearshore
6. limited entry fixed gear – dogfish
7. open access fixed gear – sablefish
8. open access fixed gear – nearshore
9. open access fixed gear – dogfish
10. California recreational-bottomfish
11. Oregon recreational-bottomfish
12. Washington recreational-bottomfish
13. Washington recreational-halibut
14. Oregon recreational-halibut

Although other commercial sectors arguably exist, one can reasonably assume that these other sectors are minor compared to those listed, or can be considered a component of one of those sectors listed. Our data set further divided sectors by coastal management area where different overfished species commonly occur: north of 40° 10' N. lat., between 40° 10' N. lat. and 38° N. lat., between 38° N. lat. and 36° N. lat., and south of 36° N. lat.. The area north of 40° 10' N. lat. is a traditional area used for management of commercial fisheries and tends to have the highest degree of impact for several overfished species, including darkblotched rockfish, yelloweye rockfish, and Pacific ocean perch. In the area between 38° N. lat. and 40° 10' N. lat., darkblotched rockfish populations are more moderate, Pacific ocean perch is nearly non-existent, and the area, and the northern portion the assessed portion of bocaccio rockfish begins. The area south of 38° N. lat. and north of 36° N. lat. contains few, if any, of the more northern overfished species such as darkblotched rockfish, but canary rockfish still tend to be caught in the area, as well as more southern oriented stocks such as bocaccio rockfish. Few canary rockfish occur south of 36° N. lat., but this area contains both bocaccio rockfish and cowcod.

Bycatch and Communities

Inspection of Tables 7-4a and Tables 7-4b shows that every community is touched in some way by the management of overfished species. (Although this table applies to the commercial sectors, recreational fisheries in the communities listed would encounter similar bycatch species.)

How the Rest of This Chapter Is Organized

The rest of this chapter provides detailed descriptions of the various sectors that make of the non-tribal commercial sectors including discussions of participation, landings, revenues, seasonality, and major fishing communities. Tribal and recreational fisheries are discussed in similar fashion. Seasonality information is presented to address considerations associated with promoting a year round fishery. In addition, the processing sector, non-consumptive users, and fishing communities are also described. After these descriptions, the next major section 7.2 describes the economic impacts of the alternatives. These impacts include direct and indirect impacts and cumulative effects.

7.1.2 Commercial and Tribal Fisheries

7.1.2.1 Overview: Total Non-Tribal Shoreside All Fisheries

Participation

Active participation in West Coast shore-based commercial fisheries has generally declined over the years 2000 to 2005 (Table 7-5). In 2005, 1,292 vessels landed West Coast groundfish, 261 landed coastal pelagic species, 1,084 landed crab, 721 landed highly migratory species, 1,339 landed salmon, and 170 landed shrimp. Groundfish vessels accounted for roughly one-third of the west coast fleet. As evidenced by the state permits purchased in the Groundfish Buyback Program, groundfish fishermen participate in these other fisheries as well, especially, the crab and shrimp fisheries. (The estimates, as they are based on fish tickets, exclude estimates of the tribal fleet and at-sea fleet which are discussed below.)

Landings and Revenues

Commercial fisheries make up the largest portion of West Coast landed catch by weight. Coastal pelagic species, followed by groundfish, crab, and highly migratory species have made up the largest landings by weight since 2000. Crab, followed by groundfish, coastal pelagic species, and highly migratory species comprise the highest-value groups from 2000–2005 (Table 7-6). The four largest gear groups by weight have been gill and trammel net, trawl, trap/pot, and troll gear (Table 7-7).

Limited entry trawlers take the vast majority of the groundfish harvest measured by weight but somewhat less if measured by value. In 2003, groundfish trawlers landed over 95% of total groundfish harvest by weight but only 64% by value (Table 7-8). The difference in trawl weight and revenue proportions is mostly due to the catch of Pacific whiting. Since whiting are caught almost exclusively by limited entry trawl vessels, they skew the overall value per unit weight calculations for this sector.

Distribution of Effort and Major Ports

See discussion below of the various subsectors (limited entry trawl, limited entry fixed gear, and open access). As discussed below, trawl vessels make most of their landings in Oregon. Newport, Astoria, and Charleston (Coos Bay), Oregon are three of the largest four ports for landed weight and exvessel revenue. Westport and Ilwaco, WA, Eureka and Crescent City, CA, Brookings, OR, and Bellingham Bay and Neah Bay, WA comprise the remaining top 10 largest ports for trawl vessel landings.

7.1.2.2 Limited Entry Groundfish Trawl Sector

Participation

West Coast limited entry trawl vessels use midwater trawl gear, and small and large footrope bottom trawl gear (defined at 50 CFR 660.302 and 660.322(b)). Midwater trawl gear is not designed to touch the ocean bottom and is therefore used to target groundfish species–such as Pacific whiting and yellowtail rockfish–that ascend above the ocean floor. Small and large footrope trawl gear are designed to remain in contact with the ocean floor and are used to target species that reside along the ocean bottom such as flatfish on the continental shelf and slope, or DTS species (Dover sole, thornyhead and sablefish complex) in deep water. Fishers generally use small footrope trawl gear in areas that have a regular substrate–few rocks or outcroppings–and more widely on the continental shelf than on the continental slope (due in large part to regulatory requirements). Fishers use large footrope trawl gear most commonly in areas that may have an irregular substrate, and along the continental slope and in deeper water.

The limited-entry shore-based trawl vessels primarily deliver their catch to processors and buyers located along the coasts of Washington, Oregon, and California, and tend to have their homeports located in towns within the same general area where they make deliveries. Larger vessels in the shore-based limited entry trawl sector focus more heavily on the DTS complex in deep water, while smaller trawl vessels focus more heavily on the shelf. Large trawl vessels also tend to participate in the trawl fishery for more months of the year than small trawl vessels. The shore-based vessels range in size from less than 40 feet to over 90 feet in length (Table 7-9).

In 2003, a fishing capacity reduction program (buyback) was implemented off the Pacific coast which retired 91 vessels from the limited entry trawl sector. These 91 vessels represented less than 40 percent of the number of boats actively engaged in the limited entry trawl sector, but approximately 50 percent of historic catch. The purpose of the program was to reduce the number of vessels and permits endorsed for the operation of groundfish trawl gear in order to increase and stabilize economic revenues for vessels remaining in the groundfish fishery and conserve and manage depleted groundfish species. Vessels that participated in the buyback program were sold, scrapped, or converted to nonfishing purposes, and those vessels cannot be used for fishing again.

The impact of the trawl vessel buyback appears to have been positive in terms of exvessel revenue per vessel. Average trawl exvessel revenues generated by non-Pacific Hake groundfish increased from approximately $108,000 to $151,000 in the years 2003 to 2004 respectively even though total exvessel revenues for the fleet decreased from approximately $25,000,000 to $22,000,000 during the same period (Figure 7-1). Declining total bottom trawl revenues in 2005 resulted in a slight decline in average revenue per vessel compared to 2004.

The impact of the trawl vessel buyback differed by region. Some ports lost a disproportionate share of their trawl fleet, while others lost relatively few trawl vessels (Table 7-10). The number of trawl landings in the major trawl ports of Eureka, Crescent City, and Avila declined by 50 percent or more.

7.1.2.2.1 Landings and Revenues from Groundfish Trawl Vessels

Trawlers catch a wide range of species. By weight, the following species account for the bulk of landings (other than Pacific whiting): Dover sole, arrowtooth flounder, petrale sole, sablefish, thornyheads, and yellowtail rockfish. Management measures intended to reduce the directed and incidental catch of overfished rockfish and other depleted species have significantly reduced rockfish catches in recent years substantially below historical levels. Of the three states, landings and revenues by non-tribal trawlers are significantly larger than the other two states (Table 7-11)

By weight, the vast majority of trawl vessel groundfish is caught with midwater trawl gear. This is due to the fact that Pacific whiting is targeted with midwater trawl gear. In contrast, the majority of trawl exvessel revenues are attributed to the bottom trawl sector). (Table 7-12)

Limited entry trawlers take the vast majority of the groundfish harvest measured by weight but somewhat less if measured by value. In 2003, groundfish trawlers landed over 95% of total groundfish harvest by weight but only 64% by value (Table 7-13). The difference in trawl weight and revenue proportions is mostly due to the catch of Pacific whiting. Since whiting are caught almost exclusively by limited entry trawl vessels, they skew the overall value per unit weight calculations for this sector.

7.1.2.2.2 Distribution of Effort by Limited Entry Groundfish Trawl Vessels

Limited entry trawl vessels focus much of their effort on DTS species along the slope, flatfish species along the shelf, and Pacific whiting above the seafloor. Historically, much effort was focused on rockfish species, but recent regulatory requirements–such as RCAs and various cumulative limits - have curtailed rockfish opportunities to protect overfished stocks. In 2005, a specific small footrope trawl designed to avoid rockfish (the selective flatfish trawl) will work to further avoid the catch of rockfish along the shelf while increasing opportunities for flatfish north of 40° 10' latitude. Opportunities to harvest DTS and flatfish species–largely in the form of differential cumulative limits and RCAs–dictate the location of much of the trawl effort, though not all effort is dictated by regulation. Vessels differ in size and technical capacity. For example, small vessels may find it more difficult to fish during the winter months because of weather and other vessels may not have the capacity to fish in deep water where DTS species primarily reside. In other cases, some vessel captains may be more knowledgeable and more successful in certain areas. This knowledge would also influence the location and timing of effort by certain vessels. Furthermore, some species are known to migrate and aggregate during certain months of the year. For example, Petrale and Dover sole are known to aggregate for spawning during the winter months, and several types of flatfish are known to migrate onto the shelf during the summer months. Fishers may target the location of their efforts according to species aggregations and the tendencies of certain fish species to migrate. Differences in knowledge, capital constraint, fish migration, and the regulatory environment can–in large part–affect the location and time of effort by commercial fishing vessels.

Table7-14 shows the depth-based annual distribution of catch made by non-shrimp trawl vessels and Table 7-15 shows the monthly distribution of catch as recorded in trawl logbook data within PacFIN. These data include bottom trawl and midwater trawl gear.

By weight, because of the buyback program, some ports appear to have lost relatively more groundfish catch than other ports. Not surprisingly, those ports that lost relatively more trawl vessels also appear to have lost relatively more catch of groundfish (Table 7-16).

Trawl vessels make most of their landings in Oregon. Newport, Astoria, and Charleston (Coos Bay), Oregon make up three of the largest four ports for landed weight and exvessel revenue during the 2000–2003 period (Table 7-17). Westport and Ilwaco, WA, Eureka and Crescent City, CA, Brookings, OR, and Bellingham Bay and Neah Bay, WA comprise the remaining top 10 largest ports for trawl vessel landings.

7.1.2.3 At-Sea Limited Entry Sector

Participation

In addition to the shore-based limited entry trawl fishery, an at-sea limited entry trawl fishery exists off the coast of Washington, Oregon, and California. The high-volume at-sea fishery targets Pacific whiting with the use of midwater trawls. Pacific whiting commands a relatively low price per pound in the market place. The limited entry at-sea sector is made up of a catcher-processor fleet and a mothership/catcher vessel fleet. A catcher-processor participates in both catching and processing; a mothership engages only in the processing of a particular catch, and relies on catch made by catcher vessels. Many of the catcher vessels that deliver to the West Coast mothership sector may also fish as West Coast shore-based trawl vessels outside the Pacific whiting season; other catcher vessels fish in West Coast waters only during Pacific whiting fishery and return to North Pacific fisheries when the Pacific whiting season closes.

The catcher/processor sector is comprised of vessels that harvest and process whiting (the fleet has typically been 6 to 7 vessels since the formation of the Pacific Whiting Conservation Cooperative in 1997). The mothership sector is comprised of catcher vessels that harvest whiting for delivery to motherships (typically 3-5 motherships operate in the fishery, with one mothership also servicing the tribal fleet). Motherships are vessels that process, but do not harvest, whiting.

According to PacFIN data, the at-sea sector annually catches over 100 million pounds of Pacific whiting, as well as several hundred thousand pounds of other types of West Coast groundfish

Unfortunately, readily available data do not exist for estimating the value of at-sea
According to PacFIN data, the at-sea sector annually catches over 100 million pounds of Pacific whiting, as well as several hundred thousand pounds of other types of West Coast groundfish Harvests of non-whiting groundfish are largely composed of harvests of yellowtail rockfish, widow rockfish and rockfish that make up the category "minor rockfish north."

Harvests and Revenue

Depending on the OY, at-sea harvests by non-tribal motherships and catcher processors have ranged since 1998 from 63,000 tons to the 128,000 tons harvested in 2005 (Table 7-18) worth $14 million (Table 7-19). The amount of non-whiting groundfish harvested by this fleet is quite small, often in the range of less than half of percent.

Distribution of Effort

The catcher-processor fleet and mothership fleet over recent years, typically harvests a major portion of their allocations in May and June. After June, most of the fleets moves on to fish off Alaska, and returns in late August or September where to fish the remainder of their allocations. During the summer months, a few catcher processors may remain to fish whiting.

Major Ports

As the majority of whiting harvested by the non-tribal at-sea fleet is processed into finished product and then transshipped at sea to foreign markets, there are no key at-sea ports, other than Seattle and Anacortes where the corporate headquarters for these companies are located.

7.1.2.4 Limited Entry Groundfish Fixed Gear Sector

Participation

Vessels deploying longlines and traps (pots) comprise the limited entry fixed gear sector. These gear types also may be used by vessels in the open access sector, but preferential harvest limits favor license holders. West Coast limited entry fixed gear vessels typically use longline and fish pots (traps) for catching groundfish. Groundfish longline activities involve anchoring a stationary line with multiple baited hooks attached to it (groundline) to the ocean floor. A buoy line attaches the groundline to a surface float, usually a buoy and pole. Fishermen leave the longline in the water for several hours to a day. The vessel returns to the gear, retrieves the buoy, and hauls the line to the surface to retrieve the gear and fish. Fish pots or traps used to harvest groundfish are generally square and have mesh or twine encompassing the exterior Fishermen drop baited traps to the bottom of the ocean connected to a surface pole or buoy with a vertical line. The fish enter the trap through a door, but cannot exit the trap unless they are small enough to escape through the mesh, or back out the door. These pots are retrieved by the vessel several hours after being set. Both longlines and fish pots can be set across diverse ocean bottom types, though longlines can get hooked on rocky areas or reefs, causing some gear loss. Limited entry fixed gear fishers typically use shore-based vessels that range in size from 30 feet to 65 feet in length, with some vessels exceeding 100 feet, and some as small as 23 feet (Table 7-21). Limited entry fixed gear vessels may also participate in open access fisheries or in the limited entry trawl fishery. Like the limited entry trawl fleet, limited entry fixed gear vessels deliver their catch to ports along the Washington, Oregon, and California coast.

This sector has been plagued by overcapacity, although a series of management initiatives have largely addressed the problem. In the early to mid 1990s the fishery was a "derby" managed by very short seasons of two weeks or less. Two Groundfish FMP amendments have helped to alleviate the symptoms of over capacity in the fixed gear sablefish fishery, effectively eliminating the short, derby season. Amendment 9 required a permit endorsement to participate in the primary sablefish fishery, and Amendment 14 introduced permit stacking. Permit stacking allows up to three sablefish-endorsed permits to be used per vessel. Through a tier system, landing limits vary with the number and type of permits held.

7.1.2.4.1 Landings and Revenue from Limited Entry Fixed Gear Vessels

Fixed gear vessels primarily target the high-value sablefish; this species accounts for a large share of landings, especially when measured by exvessel value. According to PacFIN data, the majority of limited entry fixed gear landings occur in Oregon and Washington. Oregon and Washington also have a higher price per pound for sablefish, while California has a higher price per pound for other types of groundfish. This is most likely representative of the higher amount of high valued live fish landings that occur in California, as opposed to Oregon and Washington (Table 7-22).

7.1.2.4.2 Distribution of Effort by Limited Entry Fixed Gear Vessels

Limited entry fixed gear vessels principally target sablefish, a species that tends to reside in relatively deep water (Table 7-23). The limited entry fixed gear sector is subject to rockfish conservation areas; however, the boundaries are somewhat different from those of the limited entry trawl sector. Fixed gear vessels are more prone than trawl vessels to catching some overfished rockfish species, such as yelloweye rockfish, and are therefore restricted from fishing on the continental shelf. Limited entry fixed gear vessels exert most of their effort during the late spring, summer, and early fall. The monthly distribution of effort has become more spread out over the year, and the number of vessels participating has declined as the tier system and permit stacking provisions were put in place in 1998 and 2001 respectively

Major Ports

Table 7-24 shows the top 15 ports (of the 62 receiving landings) for limited entry fixed gear landings and exvessel revenue from 2000–2003. The largest ports for limited entry fixed gear landings and exvessel revenue, located within Washington, Oregon, and northern California, differ only slightly in the order of landings by rate and of exvessel revenue. The top five ports for landings make up approximately 54% of total landings, while the top five ports for revenue make up approximately 49% of total exvessel revenues for limited entry fixed gear vessels.

7.1.2.5 Open Access Groundfish

7.1.2.5.1 The Groundfish Open Access Sector

The open access sector consists of vessels that do not hold a federal groundfish limited entry permit and target (Open Access Directed Fisheries) or incidentally (Open Access Incidental Fisheries) catch groundfish using a variety of gears. The open access appellation can be confusing because vessels in this sector may hold limited entry permits for other, nongroundfish fisheries issued by the federal or state governments. However, groundfish catches by these vessels are regulated under the groundfish FMP. For example, open access vessels must comply with cumulative trip limits established for the open access sector and are subject to the other operational restrictions imposed in the regulations, including general exclusion from the RCA.

Open Access Directed Fisheries

Participation in the directed open access fishery segment varies between years. Participants may move into other, more profitable fisheries, or they may have taking time off from fishing, or they may quit fishing altogether. Fishers use various non-trawl gears to target particular groundfish species or species groups. Longline and hook-and-line gear are the most common open access gear types used by vessels directly targeting groundfish and is generally used to target sablefish, rockfish, and lingcod. Pot gear is used for targeting sablefish, thornyheads and rockfish. Though largely restricted from use under current regulations, in the past in Southern and Central California setnet gear was used to target rockfish, including chilipepper, widow rockfish, bocaccio, yellowtail rockfish, and olive rockfish, and to a lesser extent vermillion rockfish.

Within the directed open access fishery, fishers are further grouped into the "dead" and/or "live" fish fisheries. The terms dead and live fish fisheries refers to the state of the fish when it's landed. The dead fish fishery has historically been the most common way to land fish. In 2001, the dead fish fishery made up 80% of the directed open access landings. However, more recently, the market value for live fish has resulted in increased landings in the live fish fishery. In 2001, 20% of fish landed (by weight, coastwide) by directed open access fishers was landed alive as compared to only 6% in 1996 {(PFMC 2004 PFMC 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for 2005-2006 for the Pacific Coast Groundfish Fishery. Pacific Fishery Management Council, Portland, OR, August 2004)}.

In the live-fish fishery, groundfish are primarily caught with hook and line gear (rod-n-reel), with limited entry longline gear and with limited entry pot gear, and a variety of other hook gears (e.g. stick gear). The fish are kept alive in a seawater tank on board the vessel. California halibut and rockfish taken in gill and trammel nets have increasingly appeared in the live fish fishery {(CDFG 2001) CDFG. 2001. California Marine Living Resources: A Status Report, December 2001. Sacramento, California. (Available on-line: www.dfg.ca.gov/mrd/status)}.. Live fish are sold at a premium price to food fish markets and restaurants, primarily in Asian communities in California. Only limited information exists on the distribution of effort by open access vessels. Because the open access sector has an increasingly large live-fish fishery component with nearshore species making up most of the live fish landings, effort located near shore likely accounts for most live fish landings.

In California, hook and line gear for the live-fish fishery has been limited, since 1995, to a maximum of 150 hooks per vessel and 15 hooks per line within one mile of the mainline shore {(CDFG 2001) CDFG. 2001. California Marine Living Resources: A Status Report, December 2001. Sacramento, California. (Available on-line: www.dfg.ca.gov/mrd/status)}.. Traps are limited to 50 per fisherman. In Washington, it is illegal to possess live bottom fish taken under a commercial fishing license. In Oregon, nearshore rockfish and species such as cabezon and greenling are the primary target of the live fish fishery. Sablefish and rockfish are also landed alive in Oregon, and are managed under limits which count against the federally set limited-entry allocations. The Oregon live fish fishery occurs in waters of ten fathoms or less (18 m). Only legal gears are allowed to be used to catch nearshore live fish. In early 2002, an Oregon Development Fisheries Permit was required for fishermen landing live fish species (e.g. Cabezon, greenling (except kelp greenling), brown, gopher, copper, black and yellow, kelp, vermilion, and grass rockfish (among others), buffalo sculpin, Irish lords, and many surfperch species). However, commercial fishing for food fish is prohibited in Oregon bays and estuaries and within 600 feet (183 m) seaward of any jetty.

Participation

Many fishers catch groundfish incidentally when targeting other species, because of the kind of gear they use and the co-occurrence of target and groundfish species in a given area. Managers classify vessels as being in the open access incidental fishery if groundfish comprises 50% or less of their landings, measured by dollar value. These incidental open access fisheries may also account for substantial amounts of bycatch, especially for overfished groundfish species. Fisheries targeting pink shrimp, spot prawn, ridgeback prawn, California and Pacific halibut, Dungeness crab, salmon, sea cucumber, coastal pelagic species, California sheephead (California nearshore fishery), highly migratory species, and the mix of species caught in net fisheries comprise this incidental segment of the open access sector. These fisheries and associated target species are described below.

The open access groundfish fishery consists of many vessels that predominately fish for other non-groundfish species where they inadvertently catch and land groundfish. Because these incidental vessels do not necessarily depend on their revenue from the groundfish fishery as their major source of income, understanding the level of dependency that such participants have on the open access groundfish fishery must be considered in light of their overall fisheries revenues. Table 7-25 shows the number of open access vessels by vessel length and level of dependency on the groundfish fishery (proportion of annual revenue that is from groundfish). Between November 2000 and October 2001, 1,287 vessels landed groundfish in the open access sector of the groundfish fishery. Of these vessels, 771 vessels (60%) had a greater than 5% dependency on the groundfish fishery with 345 of these vessels having a 95-100% level of dependency of groundfish. The open access fishery is dominated by vessels under 40 feet in length. About 78 percent of the vessels that landed open access groundfish between November 2000 and October 2001 were less than 40 feet on length. It is assumed that a portion of these smaller vessels fish exclusively in state waters, and thus would be excluded from the VMS requirements. However, the data is not available to identify the proportion of vessels that fish only in state waters. Approximately 36 percent of the open access vessels had a greater than 65 percent dependency on groundfish, with 56 percent of the most dependent vessels having less than $5,000 in gross fishing income. A greater proportion of vessels with lower levels of dependency on groundfish fell within income categories greater than $5,000. However, increases in higher valued groundfish catch in 2003 (primarily sablefish) may reduce the proportion of open access vessels in the lowest (<$5,000) income category.

As discussed above, fishery managers divide the open access sector into directed and incidental categories. The directed fishery comprises vessels targeting groundfish while the incidental fishery category applies to vessels targeting other groundfish, but landing some groundfish in the process. However, it is difficult to segregate vessels into these two categories because the choice depends on the intention of the fisher. Over the course of a year or during a single trip, a fisher may engage in different strategies and they may switch between directed and incidental fishing categories. Such changes in strategy are likely the result of a variety of factors, including the potential economic return from landing a particular mix of species. Table 7-26 provides recent information on open access participants for the 2000- 2003 period and is taken from the VMS EA.

7.1.2.5.2 Landings and Revenue from Groundfish Open Access Vessels

Rockfish, thornyheads, and sablefish make up most of the open access landings and revenue and hook and line accounts for the largest gear type for open access landings (Table 7-27). Fixed gear catch most open access groundfish, although non-shrimp trawl gear and net gear also make substantial landings (Table 7-28). Open access landings in the state of California have a large live fish component, which is made evident by the relatively high unit value of rockfish in that state compared to the unit value of rockfish in Oregon and Washington.

7.1.2.5.3 Distribution of Effort by Groundfish Open Access Vessels

Limited information exists on the distribution of effort by open access vessels. The open access sector is made up of many different gear types, along with directed and incidental catch, which makes it difficult to discern the location of effort, though based on the diversity of this sector, it is reasonable to assume that effort is widespread across the West Coast. The open access sector has an increasing large live-fish fishery component; because nearshore species make up most of the live fish landings, effort located near shore likely accounts for most live fish landings. The live fish fishery is a quickly growing component of the open access sector and will likely continue to grow in the nearshore areas.

As shown in Table 7-29, open access landings and revenue tend to occur primarily during the spring, summer, and fall months. Assuming that landed catch represents directed open access, and that landed catch is a function of effort, then more open access related fishing activity occurs during the spring, summer, and fall months than winter months.

Fishing Communities

Table 7-30 shows that the top open access ports are Moss Landing, Port Orford, Morrow Bay, Fort Bragg and Gold Beach.

7.1.2. 6 Tribal Fisheries

7.1.2.6.1 The Tribal Fisheries Sector

West Coast treaty tribes in Washington have formal groundfish allocations for sablefish, black rockfish, and Pacific whiting. Members of four coastal treaty tribes participate in commercial, ceremonial, and subsistence fisheries off the Washington coast. Participants in the tribal commercial fisheries use similar gear to non-tribal fishers. Fish caught in the tribal commercial fishery are distributed through the same markets as non-tribal commercial catch.

Participation

Tribal treaty fisheries are place-oriented—limited to the adjudicated U&A areas. This results in immobile fisheries that cannot move to a new location if the resources or habitat are depleted. In addition, the Tribe and its fishermen have a view of ownership of their fishing grounds rooted in centuries of use and control of these grounds. This sense of ownership influences the fishing practices of the tribes and these practices are used by the tribes to develop tribal rules and regulations to stay within the harvest limits established by the council for overfished and abundant stocks. Tribal fisheries take several species for which they have no formal allocations, and some species for which no specific allocation has been determined (7-31). Rather than try to reserve specific allocations of these species, the tribes biennially recommend trip limits for some species to the Council, which tries to accommodate these fisheries.

Groundfish fishing by the tribes occurs primarily with hook and line and trawl (7-32). All tribes participating in groundfish fisheries have longline vessels in their fleets, but as discussed below only the Makah has trawlers; and only the Makah has participated in the Pacific whiting fishery. Makah has the majority of longline vessels, followed by Quinault, Quileute, and Hoh. Since 1996, a portion of the U.S. whiting OY has been allocated to the West Coast treaty tribes. The tribal allocation is subtracted from the whiting OY before allocation to the non-tribal sectors. Since 1999, the tribal allocation has been based on a sliding scale related to the U.S. whiting OY. To date, only the Makah tribe has fished on the tribal whiting allocation. Makah vessels fish with mid-water trawl gear have also been targeting widow rockfish and yellowtail rockfish in recent years.

As the Makah Tribe has the largest tribal fleet, what follows is a detailed description of Makah groundfish fisheries and management practices. Currently, the Makah fleet is composed of 43 boats, an increase of two vessels from 2004 (Table 7-35). Twenty-nine of the boats fish for salmon, sablefish, and halibut. These boats primarily fish from March to October. Ten of the boats are small bottom trawlers. The trawl fishery is open from January to December, but primarily the fishing is done from June to October. The mid-water whiting fleet is composed of 4 mid-water trawlers who deliver to shoreside plants and to two at-sea motherships one of which also participates in the non-tribal mothership whiting fishery. Their season is from May to September. Full retention of rockfish bycatch is required (as is the case in all Makah groundfish fisheries); the bycatch is processed for human consumption and forfeited to the Tribe for distribution to food banks and similar programs. This program avoided wastage and discards of bycatch species, created a disincentive to both the catcher vessels and processor and provides full accounting of bycatch in the fishery. This in turn has reduced bycatch levels of nearly all species.

In the Makah bottom trawl fishery, the Tribe adopted the small foot rope restrictions as a means to reduce rockfish bycatch and avoid areas where higher incidences of rockfish occur. In addition, the bottom trawl fishery is limited by overall foot rope length as a means of conducting a more controlled fishery. Harvest is restricted by time and area to focus on harvestable species while avoiding bycatch of other species. If bycatch of rockfish is above a set limit, the fishery is modified to stay within the bycatch limit. The midwater trawl fishery has similar control measures. A trawl area must first be tested to determine the incidence of overfished rockfish species prior to opening the area to harvest. Vessels are provided guidelines for fishing techniques and operation of their net. Fishing effort is closely monitored by the on-board observer and harvest manager and changes or restrictions are implemented as needed to stay within the bycatch limits. Full retention of rockfish bycatch is required (as is the case in all Makah groundfish fisheries); the bycatch is processed for human consumption and forfeited to the Tribe for distribution to food banks and similar programs. This program avoided wastage and discards of bycatch species, created a disincentive to both the catcher vessels and processor and provides full accounting of bycatch in the fishery. This in turn has reduced bycatch levels of nearly all species. In developing these trawl fisheries, the Makah management practices include testing of gear, area, vessels, and catch composition before the fishery can proceed from one level to the next. In addition, a new or developing fishery must show that it can be conducted in a manner that protects existing fisheries.

Tribal Harvests and Revenues

Tables 7-33 and 7-34 shows recorded landings of groundfish species by treaty tribes from 1995 to 2003as developed by the Northwest Indian Fisheries Commission {Rob Jones, personal communication to John Devore May 18?DVB?-}. Since 1996, Pacific whiting have comprised the vast bulk of tribal landings, even though in 2000 and 2001 whiting landings were relatively low due to reduced coastwide allocations. As shown in Table 7-34, in addition to increases in Pacific whiting harvests, there has been a growth in tribal landings of flatfish and rockfish to bring total tribal groundfish revenues to a level of $7.5 million in 2005.

Distribution of Effort

The bulk of tribal groundfish landings occur during the March through April Pacific halibut and sablefish fisheries. Most continental shelf species taken in the tribal groundfish fisheries are taken during the halibut fisheries, and most slope species are similarly taken during the tribal sablefish fisheries. Approximately one-third of the tribal sablefish allocation is taken during an open competition fishery, in which vessels from the four tribes on the Washington coast have access to this portion of the overall tribal sablefish allocation. The open competition portion of the allocation tends to be taken during the same period as the major tribal commercial halibut fisheries in March and April. The remaining two-thirds of the tribal sablefish allocation is split between the tribes according to a mutually agreed-upon allocation scheme. Specific sablefish allocations are managed by the individual tribes. The fishery begins in March and goes until some time in the autumn, depending on the number of vessels participating in the fishery. Participants in the halibut and sablefish fisheries tend to use hook-and-line gear, as required by the IPHC. For equity reasons, the tribes have agreed to also use snap-line gear in the fully competitive halibut and sablefish fisheries. So a vessel that participated in a fully competitive sablefish fishery, but that did not land any halibut (and therefore was not subject to IPHC requirements), would still be required by tribal regulations to use snap-line gear.

Major Ports

Table 7-35 shows the distribution of vessels engaged in Tribal groundfish fisheries by major port. These ports are Westport, Neah Bay, and La Push.

7.1.3 Recreational Fisheries

In 2004, there was a major change in how recreational statistics are collected for West Coast fisheries, especially for the collection of statistics on California recreational anglers as the methodologies employed under the Marine Recreational Fisheries Statistics Survey (MRFSS) were replaced by those of a California Recreational Fisheries Survey. The California Recreational Fisheries Survey (CRFS) is the new method for estimating total marine recreational finfish catch and effort in California. The CRFS is a coordinated sampling survey designed to gather catch and effort data from anglers in all modes of marine recreational finfish fishing. This program incorporates and updates the comprehensive sampling methodologies of the former Marine Recreational Fisheries Statistics Survey (MRFSS) and the California Department of Fish and Game's (CDFG) Ocean Salmon Project. This program was fully implemented state-wide in January 2004.

The direct comparability of pre-2004 data with data collected under the new system is still being evaluated. So the discussion below replicates the discussion of recreational fisheries and 1996-2003 trends found in: Pacific Fishery Management Council. 2004. Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery Final Environmental Impact Statement as it is still the best available overview of West Coast recreational fisheries. This discussion is then followed by presentation of 2004-2005 recreational data provided by the States through the Council's Groundfish Management Team process. The California estimates reported below are still under review for there are indications that the preliminary data provided significantly underestimate charterboat effort. However, it is believed that when better estimates are corrected, the results will not alter the relative ranking of economic consequences of the alternatives.

Participation

Demand for recreational trips and estimates of the economic impacts resulting from recreational fishing are related to numbers of anglers. In the U.S., over nine million anglers took part in 76 million marine recreational fishing trips in 2000. The West Coast accounted for about 22% of these participants and 12% of trips. 70% of West Coast trips were made off California, 19% off Washington, and 11% from Oregon {Gentner 2001}.

Recreational fishing is an important economic contributor to the west coast in general, and to some communities specifically. The recreational fishing sector can be divided into two groups; the charter fleet and the private fleet. The private fleet is typically made up of vessels owned by residents living in or near areas where they fish. The charter fleet is a for-hire fleet that plays a large role in the tourism sector of many west coast communities, and opportunities to fish on a charter vessel can be a substantial draw for tourists considering a visit to the coast.

The distribution of resident and non-resident ocean anglers among the West Coast states in 2000, 2001, and 2002 demonstrates the importance of recreational fishing, especially in Southern California (Table 7-36). Southern California has more than twice the number of resident recreational marine anglers than the next most numerous region, Washington State. While most of the recreational anglers were residents of those states where they fished, a significant share was also non-residents. Oregon had the largest share of non-resident ocean anglers in all three years.

In terms of vessels, about 750 charterboats make up the charterboat fleet (Table 7-37); estimates of private boats are unavailable. In terms of proportion, Table7-38 shows the distribution of trips by boat mode and region in 2003. Approximately 80% of the trips taken are from private vessels. Almost 90 percent of all trips taken and half of the charter vessel trips are associated with California.

Recreational fishing in the open ocean has generally been declining slightly since 1996 (Table 7-39); however, charter effort has decreased while private effort increased during that period. Part of this increase likely resulted from longer salmon seasons associated with increased abundance. Some effort shift from salmon to groundfish for example likely occurred prior to 1996 when salmon seasons were shortened.

Distribution of Effort

Fishing effort is related to weather, with relatively more effort occurring in the milder months of summer, and relatively less in winter (Table7-38). As might be expected, this effect is more pronounced in higher latitudes, although the reasons include opportunity as well as climate. Salmon seasons are longer in California than in Oregon, which in turn are longer than in Washington. Until recently, groundfish seasons were also more restrictive in Washington, with the lingcod season being closed from November through March.

7.1.3.1 2004-2005 State Recreational Estimates

Through the Pacific Fishery Management Council's Groundfish Management Team process, total angler trips by mode and by target were developed by each of the States for years 2004 and 2005. In terms of total trips, there was a decline from 1.6 million trips to 1.2 million trips, with all states and modes in decline, particularly the California charter boat mode. (As indicated above, these latter estimates may be underestimates.)

The following estimates of trips where groundfish was a target was provided through the GMT process (Table 7-41). Unlike the total anger trips, total groundfish trips increased by 20 percent in 2005 over 2004. Except for Coos Bay which showed a decline in charter boat trips, this pattern is consistent across all states, areas and ports, and by mode. These estimates suggest that anywhere from 25% (2004) to 40% (2005) of West Coast angler trips are trips targeted on groundfish. It should be noted that groundfish are caught incidentally when other species, such as salmon, are targeted. While the contribution of groundfish catches to the overall incentive to engage in a recreational fishing trip is uncertain, it seems likely that the possibility or frequency of groundfish catch on a trip adds to overall enjoyment and perceived value of the trip.

7.1.4 Buyers, Processors, and Seafood Markets

7.1.4.1 Processors and Buyers

Excluding Pacific whiting delivered to at-sea processors, vessels participating in Pacific groundfish fisheries deliver to shore-based processors within Washington, Oregon, and California. Buyers are located along the entire coast; however, processing capacity has been consolidating in recent years. Several companies have left the West Coast or have chosen to quit the business entirely. Remaining companies have purchased some former plants {Research Group 2003}, but other plants have remained inactive. This has led to trucking groundfish from certain ports to another community for processing. Therefore, landings do not necessarily indicate processing activity in those communities. However, examination of the species composition of landed catch by state can lead to inferences of some processor characteristics.

According to PacFIN data, in 2002 Oregon had the largest amount of groundfish landings (56%), followed by Washington (28%), and California (16%). In contrast, Oregon has the largest amount of exvessel revenue (40%), followed by California (32%) and Washington (22%), respectively. Oregon accounts for the majority of Pacific whiting landings, which creates a large difference between the percentage of landed catch and exvessel revenue because Pacific whiting has a relatively low price per pound. The relatively high amount of Pacific whiting being landed in Oregon may create a case where many processors must generate capacity to handle large quantities at a time. Groundfish processors in Washington may receive landings from Alaska fisheries. Depending on the amount of catch Washington processors can draw from Alaska fisheries, some groundfish processors may require the capacity to process large amounts of product. California processors concentrating on West Coast fisheries may focus on relatively smaller throughput of groundfish.

The seafood distribution chain begins with deliveries by the harvesters (exvessel landings) to the shoreside networks of buyers and processors, and includes the linkage between buyers and processors and seafood markets. In addition to shoreside activities, processing of certain species (e.g., Pacific whiting) also occurs offshore on factory ships.

According to data from the Bureau of Labor Statistics, the number of seafood processing establishments along the west coast has declined in recent years. Further examination of PacFIN data shows the number of companies buying groundfish along the West Coast has also generally declined in recent years. When buyers are classified on a species basis—How many buyers purchased groundfish—we can see slight evidence of a decline in California and Washington (Table 7-42). When buyers are classified on a groundfish gear basis—how many buyers purchased sablefish from fixed gear-sablefish fishermen---evidence of decline is stronger (Table 7-43). Because of the multi-species basis of most buyers it is hard to develop unique counts of buyers by either of these two methods on a state basis. However, the total number of buyers from all fisheries can be uniquely determined. In California, the number of unique buyers in 2005 is estimated to be 465, a decrease of 21 percent from 2004. The number of Oregon buyers fell by 10% and the number of Washington buyers fell by 8% over the same time period.

7.1.4.1.1 Processing Companies Purchasing Groundfish

In terms of quantity, the processing of west coast groundfish is dominated by a small number of companies. For this section, an estimate of unique groundfish companies was derived by grouping PacFIN information on groundfish buyers. Buyers with like names were assumed to be individual companies. For example, a hypothetical buyer with the name ZZZ seafood – Astoria was assumed to belong to the same company as a buyer with the name ZZZ seafood – Ilwaco. Using this approach, the results show that the three largest companies bought approximately 78% of commercially caught groundfish landed on the west coast in the years 2004 and 2005 (Table 7-44, Figure 7-2). When a similar analysis is done based on ex-vessel revenues, the top three companies purchase about 56% of the groundfish sold. (For more accurate estimates, analysts would have to compile lists of affiliated companies and then map them to the PacFIN buyer codes. In addition, estimates of fish purchased by non-affiliated buyers and sold to a company for processing would also have to be developed.)

Supportive of this analysis is a description of the top 10 Seafood suppliers in the United States according to Seafood Business (May 2006); three of which participate in Pacific Groundfish Fisheries. Their corporate strategies affect the Pacific Groundfish fishery. Employment and location of facilities will vary as companies pursue profits, market share, and efficiencies. For example, the build up of Arctic Alaska Company (an Alaska based company who built a surimi plant and fish meal plant in Newport Oregon while bring down catcher processors from Alaska to fish whiting, its eventual sale to Tysons (a major poultry company who wanted to add seafood to its product line), and the selling out of Tyson's fishing business assets (including the shoreside surimi and fish meal plants, and several catcher-processors) to companies like Trident (who before the purchase had little involvement in Pacific groundfish) has indirectly reshaped the Pacific groundfish fishery. Below are the Seafood Business descriptions of Pacific Seafood Group (a shorebased company), Trident Seafoods Corporation (shorebased and at-sea), and American Seafoods Group (at-sea).

> Pacific Seafood Group #1 Sales-$874 million—Key Species: Dungeness crab, halibut, king crab, Pollock, salmon, shrimp. "With 2005 sales of $874 million, Pacific Seafood Group slid into the No. 1 spot on the Seafood Business Top 25 list for the first time this year. After an active 2003 and 2004, Pacific wasn't involved in any acquisitions or mergers last year or early this year. Instead the company grew organically, picking up new customers and increasing sales by approximately $174 million from 2004 to 2005. In 2004, Pacific acquired Seacliff Seafoods, a distributor with facilities in Houston, San Antonio and Wilmington, California. In 2003, the company purchased Starfish, a Bellevue Washington seafood processor and distributor and Craig & Hamiliton, a Stockton, California value-added meat processor. Now Pacific operates 15 processing facilities along the West Coast and 10 distribution facilities in Washington, Oregon, California, Idaho, Montana, Nevada and Utah."
>
> Trident Seafood Corporations #3-Sales-$800 million—Key Species: cod, halibut, whiting, Pollock, king crab, salmon, snow crab. "Trident Seafoods Corp. has been busy growing over the past two months. In March, the company acquired Louis Kemp Seafood, which markets the No. 1 retail surimi-seafood brand, from Con-Agra Foods one of the nation's largest public conglomerates....Then, in April, Trident purchased Ocean Beauty Seafoods' seven Alaska processing facilities and merged its distribution and smoked-fish business with its Seattle rival. The acquisition of Louis Kemp and the deal with Ocean Beauty will surely push Trident's 2006 sales over the $1 billion mark. Trident's prior major acquisition occurred in 2004 when it bought Norquest Seafoods of Seattle and its Portlock and Silver Lining brands. Trident operates 25 fishing vessels and at-sea processors and 18 processing plants throughout Alaska, British Columbia, Washington and Oregon." (Note—In early May 2006 the proposed purchase of Ocean Beauty Seafoods was called off.)
>
> American Seafoods Group #10-Sales $514 million. Key species: catfish, cod, hake, Pollock, scallops, yellowfin sole. "In February, Centre Partners Management sold its remaining 23 percent equity interest in American Seafoods Group to Coastal Villages Region Fund and a management group led by Chairman Berndt Bodal, increasing their ownership to 45 percent and 51 percent respectively of the company's voting equity. The buyers dished out nearly $82 million for the balance of Centre Partners' stake. Centre Partners is the New York investment Group that formed American Seafoods Group with Bodal in 2000, acquiring American Seafoods Co. and Frionor USA's New Bedford, Mass., processing facility from Norway Seafoods. The purchase came two years after the adoption of the American Fisheries Act, which forced many foreign owned fishing fleets out of U.S. waters. American Seafoods expanded in 2002 when it bought Southern Pride Catfish of Greensboro, Ala. Two years later, the company ditched a year and-a-half-long bid for an initial public offering.

7.1.4.1.2 Processing Labor, Processing Capital and the Groundfish Fishery

Processing Labor

Employment and wage information from the Bureau of Labor Statistics shows that seafood processing along the west coast generates approximately $380 to $420 million dollars in the form of wages annually to seafood product preparation and packaging employees, and in most years this sector employs over 10,000 workers (Table 7-45). The largest state in terms of processing wages and employees is Washington state, followed by California, and Oregon respectively. Washington benefits from the large degree of participation in Alaska-based fisheries which make up a substantial portion of nationwide catch, while processing in Oregon and California is dominated by catch occurring in west coast fisheries.

In support of this EIS, the Report: "Trends in Fishing and Seafood Processing Related Employment Statistics" which is attached, was developed in an attempt to mine all available federal data on seafood processing and on employment (Attachment 7-1). Its conclusions also support the analysis above. This report also has shed some light on seasonality of employment, age and gender of seafood workers. For the seafood processing industry, the 35-44 age group is the predominant workforce in al three states with this category representing 30-35%.of workers employed. The next largest group is the 45-54 age group. The gender distribution of employees in the seafood processing industry differs across states. California is the most evenly distributed with some counties where female employees outnumber males. In Oregon and Washington males workers are the majority with ~ 60 and 70% respectively.

Processing labor can be generally divided into two types; specialized labor and unspecialized labor. Unspecialized labor is characterized as workers that can easily transition their skills to other industries and employers. For example, a forklift driver could be characterized as an employee within the unspecialized labor category. That worker can easily transition between a seafood processing employer and another employer that may be involved in office supplies for example. Specialized workers are those workers that have a particular skill set which is not easily converted to other industries. Workers in this category include those that fillet fish. Filleting is a skill that is specific to the seafood industry.

Workers within the unspecialized category are typically in higher supply and are relatively easy to hire if there happens to be a shortage of workers in that category. These workers require less training than specialized workers and new laborers in the unspecialized category are unlikely to negatively impact productivity for any given amount of time. Specialized workers on the other hand are relatively short in supply, and if there is a shortage of workers in this category, newly hired specialized labor is likely to require training and will have relatively low productivity in the early stages of their career. In the seafood processing industry, many laborers are transient and their employment is often temporary in nature due to the cyclical nature of fisheries. However, processors are more likely to try to retain specialized laborers on a year round basis as re-hiring and re-training new workers in the specialized category will reduce productivity. This makes the groundfish fishery one of the most important fisheries for many seafood processors.

According to the PFMC Groundfish FMP, the Council attempts to manage the groundfish fishery on a year-round basis. This year round nature of the fishery is important to those processors that try to keep specialized labor employed on a year round basis. A year round fishery keeps product volume flowing through the plants, gives the fish filleters product to process, and ultimately keeps specialized laborers employed. Without a year round fishery, these laborers often find work elsewhere and this negatively affects processing revenue and product quality. Other fisheries are typically not managed on a year round basis because of several reasons including availability (salmon and albacore for example) and seasonal quality of the harvested species (Dungeness crab for example). Groundfish on the other hand can be available to fishers and marketable by processors on a year round basis.

Figure 7-3 depicts the monthly purchases by major buyers of groundfish—each line is a buyer. The lines reflect the percent of total purchases by the buyer that are comprised of groundfish. From this graph, it can be determined that there isn't a single month where there is not at least one major buyer that isn't making a major purchase of groundfish.

Processing Capital

Unlike many forms of processing labor, the capital involved in fish processing is not easily substitutable for use in other industries. Capital tends to be fixed in its location and designed to handle fish products as opposed to some other type of food product. A processing facility is constructed to handle seafood and produce some output product that may be fillets, surimi, head and gutted fish, or some combination of products. The size of these facilities is typically constructed around some expectation of what the future holds-in terms of quantity-for commercial fisheries landings.

Many fisheries are characterized by swings in available product due to seasonality and year to year fluctuations in species abundance. This means that during the off-season, or years when there are declines in species abundance, processor capital is idle. Groundfish (outside of Pacific whiting) was historically one of the more stable fisheries on the west coast, and is a fishery that is prosecuted on a year round basis. This sense of stability combined with an expectation of year round landings historically gave managers of processing plants some increased degree of certainty when planning for the future and investing in capital in an otherwise highly variable and uncertain industry. The recent decline in landings of traditional groundfish species has eliminated much of that certainty and meant that increasing amounts of processing capital have been left idle. Idle capital increases the cost of producing a unit of output, so naturally, some plants reliant on groundfish have closed down and consolidation has occurred within portions of the processing industry {The Research Group. 2003}. This is verified by the decrease in number of processing establishments over the past several years as reported by the Bureau of Labor Statistics (7-45).

7.1.4.2 Markets and Prices

Much of this discussion will be updated after the Council Meeting. Updated or revised sections are marked with a "*". Unless otherwise noted discussion below is taken from the 2005-2006 Groundfish Specifications EIS.

7.1.4.2.1 Live Fish Markets

An important and growing share of groundfish harvest is delivered live. These deliveries help feed the growing trade in live seafood consumed in restaurants. Groundfish delivered live were primarily nearshore rockfish and perch, but also included thornyheads, sablefish and lingcod. About 86% of live fish landings were in California with the remainder in Oregon {PFMC 2004b}. There were no recorded live fish landings in Washington. Significantly higher exvessel price was paid for live product. The coastwide average price for live product was nearly four dollars per pound, compared with under one dollar for other deliveries of the same species.

7.1.4.2.2 West Coast Groundfish and the World Market

West Coast groundfish compete in a global market, not only with similar species produced in other regions of the world, but also with other fish species such as salmon and tuna. In addition, fish compete with other sources of protein in consumers' budgets. More than 4.7 million mt of fish and other seafood were landed in the U.S. in 2000, approximately the same amount landed in each of the prior two years (DOC 2001). West Coast groundfish contributed about 0.14 million mt, 0.13 million mt, and 0.12 million mt to this total in 1998, 1999 and 2000, respectively. Pacific whiting, a relatively abundant but low price species, comprises about two-thirds of West Coast groundfish landings by weight, but only around 10% of groundfish exvessel revenue.

Production of farm-raised fish has increased rapidly in recent years. In 2000, more than 0.4 million mt of cultured fishery products were produced in the U.S., and more than 45 million mt were raised worldwide. Salmon aquaculture demonstrates the emerging importance of farmed species. While commercial salmon harvest is still near the 1980 to 1997 annual average, world salmon supply has tripled since 1980 due to a nine-fold increase in farmed salmon to 1.5 million mt in 2000.

An objective of groundfish management has been to spread harvest of the annual OY over as much of the year as possible. Consequently, groundfish harvesting occurs in every month, although beginning in the late 1990s, it took on increased importance during the summer months when sablefish harvest peaked during the primary limited entry fixed gear fishery. The bulk of whiting fishery also occurs during the summer.

Groundfish have historically provided West Coast commercial fisheries participants with a relatively steady source of income over the year, supplementing the other more seasonal fisheries. Although groundfish contributed only about 17% of total annual exvessel revenue in 2000, seasonally groundfish played a more significant role, providing one-fifth to one-third of monthly exvessel revenue coastwide during April and the three summer months. The peak value contribution by the groundfish fishery in 2000 was sablefish during August (20% of exvessel revenue). Flatfish harvest supplied between 3% and 9% of monthly exvessel revenue throughout the year, and rockfish contributed an additional 2.5% to 6.8% to monthly exvessel revenue. For northern parts of the coast, groundfish is particularly important just before the start of the December crab fishery.

7.1.4.2.3 Exvessel and Fuel Prices*

Table 7-46 lists ex-vessel prices for several west coast species, total groundfish excluding whiting, fuel, and estimates of bottom trawl revenue per hour fished for the period 1999-2005. The period was chosen based on available fuel prices collected by the PSMFC. All prices are averages except the fuel price. Fuel prices are June prices as reported by Newport Oregon fuel docks. The trends in these prices give the following perspectives:

Whiting—prices appear to range very little from year to year
Flatfish—prices declined in 2004 and 2005 but not to the 1999 level,
Rockfish—After a major increase in 2004, price fell significantly in 2005
Total Groundfish—prices in 2004 and 2005 similar but not as low as 1999.
Bottom trawl Revenue per hour—Increased significantly in 2003 and 2004. 2004 increase may be due to the buyback as fleet reduced by 1/3.
Fuel—2004 and 2005 fuel prices significantly higher while total groundfish prices declined

The implications from there trends are that all sectors are facing rising fuel prices; and, some sectors, particularly the bottom trawl sector may also be facing declining ex-vessel prices.

7.1.4.2.4 Exprocessor and Wholesale Prices

While producer prices for groundfish products have not fared quite as badly as for other frozen fish (including salmon), they still are significantly below recent highs. The trend may be flat or still lower in the future {(2005-2006 EIS, Appendix A Table7-9)}. Increasing production of farmed salmon is partly responsible for a continuing slump in salmon commodity prices. Producer prices for meat products in general have been relatively weak, thereby helping to hold down prices for competitive fish protein. Preliminary 2003 estimates of producer price indices for fish and meat products were higher than seen in recent years, possibly due to the continuing improvement in the world economic outlook.

7.1.4.2.5 Trade and Domestic Demand

Most West Coast groundfish compete in the fresh and frozen fish product markets. In 2000 the U.S. imported 1.8 million mt of edible fishery products, including 1.5 million mt of edible fresh and frozen fish products. In 2000 the U.S. exported about one million mt of edible fishery products, including 190,000 mt of edible, fresh or frozen flatfish and groundfish products. One third of edible fishery exports were to Japan. While surimi was the single largest component of total fresh and frozen exports by weight, salmon was the most valuable export, generating $353 million on the 100,000 mt of fresh and frozen product shipped, and another $146 million from exports of canned product. Asia was the largest export region, absorbing 61% of U.S. fishery exports by volume. Japan alone bought 34% of total fishery exports, and South Korea and China took 11% and 10%, respectively {2005-06 EIS, Appendix A Section 7.1}.

From 1910 through the early 1970s, annual per-capita fish consumption in the U.S. generally ran between 10 pounds and 12 pounds edible weight. Beginning in the early 1970s, per-capita consumption increased, and in the mid 1980s began shifting upward again to the 15-pound to 16-pound range where it has generally remained since 1985. In 2000 annual per-capita U.S. fish consumption was estimated to be 15.2 pounds. U.S, Seafood Consumption reached a record 16.6 pounds per capita in 2004.

7.1.4.2.6 Market and Non-market Consumer Goods

For goods exchanged in markets where a consumer price can be determined (for example seafood), price and quantity information can be used to estimate the benefits consumers derive from consumption activities. A given regulatory action may have little or no impact on consumers if changes in the quantity of fish available are insufficient to have an effect on prices. This is especially true if imports or other protein substitutes are readily available. In the market for recreational experiences, individuals pay fees to participate in recreational fishing trips on charterboats. Price and quantity information from these trips might allow estimation of the benefits participants derive from this type recreational fishing. However, charter trips may often be purchased as part of a bundle of goods and services that include nonfishing recreational activities. Therefore, the estimation of benefits from recreational charter activities is less straightforward than for marketed consumer goods.

For other consumer goods, especially bundles of goods and services such as a recreational fishing trip taken on a private vessel, the prices and quantities associated with each transaction are much more difficult to determine. For the private recreationalist, the amount spent on fishing gear, licenses, and other goods necessary to carry out a particular fishing trip is difficult to isolate. The term "private" is used here to designate a recreational fisher fishing from a private vessel, the shore, bank or a public pier, as opposed to using a charter vessel. Depending on the value a particular individual places on alternatives to fishing, the maximum benefit associated with a fishing trip may far exceed actual trip expenditures.

7.1.4.3 Consumptive versus Nonconsumptive Activities

The sectors benefiting from a resource can generally be placed into one of three groups: consumptive users (e.g., recreational fishers, commercial harvesters, and processors), nonconsumptive users (e.g., wildlife viewers), and nonusers (e.g., members of the general public who derive value from knowing that a species is being maintained at a healthy biomass level). The following table displays the general relationship between use/non-use and consumptive/nonconsumptive types of activities.

Relationship between Use/Nonuse and Consumptive/Nonconsumptive Activities

	Consumptive	Nonconsumptive
Use	Commercial and Recreational Fishing, Processing.	Wildlife Viewing
Nonuse	N/A	Existence Value, Options Value, Bequeathal Value

In economic terms, renewable resource management entails a fundamental tradeoff between current and future costs and benefits. When management needs call for a substantial reduction in allowable harvests, additional costs may be born by the direct consumptive users, who may be left with much smaller harvests than they had been accustomed to. While this near-term sacrifice may create much greater harvest opportunities in the future once the stock has been replenished—depending on the duration of the rebuilding period—many fishers and processors may be unable to weather a long down period, opting instead to go out of business.

Nonconsumptive users may benefit from the use and nonuse values provided by the resource. Wildlife viewing and the derivation of secondary benefits from ecosystem services are examples of non-consumptive use values. One or more of the following nonuse benefits may accrue from the preservation of fish stocks at higher levels of abundance: (1) existence value derived from knowing a fish population or ecosystem is protected without intent to harvest the resource; (2) option value placed on knowing a fish population, habitat, or ecosystem has been protected and is available for use, regardless of whether the resources are actually used; and (3) bequeathal value placed on knowing a fish population, habitat, or ecosystem is protected for the benefit of future generations. Offsite nonconsumptive uses of resources are public in nature in that no one is excluded from deriving the identified benefits, and one person's enjoyment does not affect another's potential benefit.

The existence of coastal fishing communities in themselves may have intrinsic social value. For example, the Newport Beach (California) dory fishing fleet, founded in 1891, is a historical landmark designated by the Newport Beach Historical Society. The city grants the dory fleet use of the public beach in return for the business and tourism this unique fishery generates.

Value may also be placed on biological diversity. The value of biological diversity may be part of the total value placed on a site by nonconsumptive users (onsite or offsite). Three levels of biological diversity have been identified, (1) genetic diversity within a species, (2) species diversity (richness, abundance, and taxonomic diversity), and (3) ecosystem diversity. Ecosystem diversity encompasses the variety of habitats, biotic communities, and ecological processes (Caribbean Fishery Management Council 1998). Healthy ecosystems characterized by high biological diversity are generally able to provide a wider range of ecosystem services than are available from damaged or less diverse ecological communities. Examples of such ecosystem services include the nutrient recycling and filtering capabilities of wetlands, and the CO_2 sequestration function provided by the ocean (which is an important carbon sink).

The total societal value placed on offsite nonconsumptive use of a stock or component of the ecosystem will also depend on: (1) the size of the human population, (2) the level of income, (3) education levels, and (4) environmental perceptions and preferences (Caribbean Fishery Management Council 1998).

The above relationships imply that as human populations and the affluence of those populations increase, and as fish stocks and their ecosystems are depleted, nonconsumptive values associated with maintaining ocean resources are likely to increase. Another implication of these relationships is that once the basic integrity of ecosystem processes and marine fisheries components are preserved, the likely additional benefit from incremental increases biomass will decrease.

Non-Consumptive Users

7.1.5 Fishing Communities

Figure 7-4 and Table 7-47 are provide to the reader as aids in for reviewing references to ports, communities, counties, and recreational areas.

The Magnuson Stevens Act requires among other things that the time period for rebuilding an overfished species "be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem;..."

7.1.5.1 Community Descriptions

Many documents were used to develop the discussion found in this section. For more detail on the relationship of bycatch species to fisheries sector, port and community, the reader is directed to the attached: "Economic Revenue and Distributional Impacts Associated with Overfished Species Management in West Coast Commercial Groundfish Fisheries" In addition the reader is directed to Tables 7-4a and 7-4b. For additional reference, Section 8.1.6 of the 2005-2006 EIS and its associated Chapter 8 of Appendix-A contains information on fishing communities as well. For a much more expansive discussion of fishing communities, the reader is referred to the NMFS Northwest Fisheries Science Center website where detailed descriptions of fishing communities: http://www.nwfsc.noaa.gov/research/divisions/sd/communityprofiles/index.cfm. The reader is also referred to the Environmental Justice discussion found below, which contains a discussion of identifying communities of concern with respect to minority and low income populations.

In addition to this data, PacFIN data tables developed by NMFS SWFSC that describe by port and sector, the number of dealers, vessels, revenues, landings, vessel trips were used to develop the groundfish sector summaries found in Attachment 7-3 To synthesize the information found in all of the tables described above, the key analysis done for this EIS is the Fishing Community Engagement, Dependence, Resilience and Identification of Potentially Vulnerable Communities which is also attached.(Attachment 7-4of Appendix?) The key results of this study follow.

7.1.5.2 Fishing Community Engagement, Dependence, Resilience and Identification of Potentially Vulnerable Communities

To help the Council with determining the needs of fishing communities, numerous indicators were developed to characterize and rank communities and counties to the degree that a community or county was:

"engaged"—level of involvement in fishing
"dependent"—involved in the groundfish fishery
"resilient"—able to adapt to change
"vulnerable"—"highly dependent" and "having low resilience"
"most vulnerable" – "highest dependence" and "least resilient"

The methodology and results are presented in Attachment 7-4; Attachment 7-4 contains the following tables;

Table 1. Socioeconomic and cultural indicators
Table 2. Determining dependence
Table 3. Methodologies used in past research to identify dependence
Table 4. Determining resilience
Table 5. Linking dependence and resilience to identify vulnerable areas
Table 6. Distressed areas
Table 7. Commercial indicators and rankings city
Table 8. Commercial indicators and rankings by county
Table 9. Commercial fishing engagement scores by city
Table 10. Commercial fishing engagement scores by county
Table 11. Groundfish dependency scores by city
Table 12. Groundfish dependency scores by county
Table 13. California charter vessels ranked by region
Table 14. California recreational indicator values and rankings by region
Table 15. Oregon and Washington recreational indicator values and rankings by city
Table 16. California recreational engagement scores by region
Table 17. Oregon and Washington recreational engagement scores by city
Table 18. Resiliency indicator values and rankings by city
Table 19. Resiliency indicator values and rankings by county
Table 20. Resiliency scores by city
Table 21. Resiliency scores by county
Table 22. Commercial and recreational scores and identification of vulnerable cities
Table 23. Commercial and recreational scores and identification of vulnerable counties

Below are the conclusions of the study.

7.1.5.2.1 Vulnerable Commercial Communities and Counties

With regard to engagement in commercial fishing, twenty-nine cities are identified as "vulnerable" or "most vulnerable" areas. The "most vulnerable" area label indicates the highest levels of engagement (or dependence) and the lowest levels of resilience. Ilwaco and Moss Landing are most vulnerable with regards to engagement in commercial fishing. Ilwaco and Moss Landing have the highest levels of engagement in fishing (score of four and three, respectively) and resiliency (score of three and four, respectively). Other vulnerable areas include Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Ilwaco, Moss Landing, Port Orford, Santa Cruz and Winchester. All have high fishing engagement scores (two or greater) and low resiliency scores (two or greater). Newport, San Pedro and Westport all have high fishing engagement (score of four) but lower resiliency scores (score of one).

With regard to dependency on the commercial groundfish fishery, thirty-two cities are identified as vulnerable areas. Neah Bay is identified as a most vulnerable area. Other vulnerable areas include Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Moss Landing, Pacific City, and Port Orford. All have high groundfish dependency scores (two or greater) and low resiliency scores (two or greater). Morro Bay, Newport, and Oceanside all have high groundfish dependency (score of three) but lower resiliency scores (score of one). Chinook, Garibaldi, La Push, and Ilwaco all have higher groundfish dependence (score of one) and the lowest resiliency scores (three or more). Several vulnerable areas that are cities are identified as highly engaged and highly dependent (see Table 22).

Astoria, Garibaldi, Gold Beach, and Westport rank in all city categories: commercial and recreational engagement and dependency as well as low resiliency.

Sixteen counties are identified as vulnerable areas with regards to commercial fishing engagement. Six counties are labeled as most vulnerable areas and include Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific counties. All have high commercial fishing engagement scores (three or more) and low resiliency scores (three or more). Grays Harbor and Lincoln counties score highest in fishing engagement (scores of four) and lowest in resiliency (scores of four).

Seventeen counties are identified as vulnerable areas with regard to groundfish dependence. Clatsop, Coos, Curry, Grays Harbor, Lincoln, and Los Angeles counties score as most highly dependent (scores of two or more) and least resilient (scores of two or more). Several vulnerable areas that are counties are identified as highly engaged and highly dependent (see Table 23).

7.1.5.2.2 Recreational fishery

Ten cities are identified as vulnerable areas with regard to recreational fishing in Oregon and Washington. These cities are bolded in Table 22 under the recreational column. Astoria, Depoe Bay, and Garibaldi are all highly engaged in the recreational fishery (score of two or more) and least resilient (score of two or more). Garibaldi is the only city labeled as "most vulnerable" due to its high scores in both engagement/dependence on recreational fisheries and low resiliency.

Other recreational vulnerable cities include Gold Beach, La Push, Neah Bay, Newport, Pacific City, Westport, and Winchester. Newport has very high score in recreational engagement (score of five) but a lower resiliency score (score of one). La Push, Neah Bay and Winchester all have lower recreational engagement scores (scores of one) but very low resiliency scores (score of four or more).

It was not possible to identify recreationally engaged vulnerable areas in California due to the two-county and regional level recreational data that was available with regard to recreational fishing, compared to city and county level data available for the resiliency indicators. However, we were able to identify some California communities as potential vulnerable areas based on commercial engagement in and dependency on the groundfish fishery. Table 16 shows that San Luis Obispo through Santa Cruz counties and San Diego through Los Angeles counties are most engaged in recreational fishing and dependent on the groundfish recreational fishery. Los Angeles, San Luis Obispo and Santa Barbara counties are all ranked as least resilient in Table 23.

7.1.5.2.3 Summary

In summary, thirty-eight cities and eighteen counties are identified as commercial and/or recreational vulnerable areas (areas with high engagement or dependence on commercial or recreational fisheries and low resilience to change). Tables 22 and 23 display the results of the analysis. To qualify as a vulnerable area, a city or county must be listed in the top one-third of ranked indicator values for at least one engagement or dependency indicator and one resiliency indicator. When stricter ranking requirements are applied so that a community has to be ranked in the top one-third of an indicator twice under engagement and/or dependence and resilience, a smaller pool of cities and counties qualify. These seventeen cities include Astoria, Bellingham, Bodega Bay, Coos Bay, Crescent City, Depoe Bay, Eureka, Fort Bragg, Garibaldi, Ilwaco, Moss Landing, Neah Bay, Newport, Pacific City, Port Orford, Santa Cruz, and Winchester Bay. The fifteen counties include: Clatsop, Coos, Curry, Del Norte, Grays Harbor, Humboldt, Lincoln, Los Angeles, Mendocino, Monterey, Pacific, San Luis Obispo, Tillamook, Wahkiakum, and Whatcom counties. If even stricter ranking requirements are applied so that a community must be ranked in the top one-third of an indicator three times under engagement and/or dependence and resilience, four cities and six counties are identified as vulnerable. These cities and counties are labeled "most vulnerable". The cities include: Garibaldi, Ilwaco, Moss Landing, and Neah Bay. The counties include: Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific counties.

7.1.5.3 Environmental Justice Communities of Concern

This Section repeats the discussion found in The final EIS for the 2005-06 specification document {PFMC (Pacific Fishery Management Council) 2005?DBD Final Environmental Impact Statement for the Proposed Groundfish Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-06 Pacific Coast Groundfish Fishery. Pacific Fishery Management Council. Portland, OR, January 2005? DBD}

Environmental Justice Considerations

7.1.5.3.1 Identifying Communities of Concern

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to identify and address "disproportionately high adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations in the United States." Fishery management actions promulgated by the Pacific Council and implemented by NMFS can have environmental and socioeconomic impacts over a very wide area; the affected area of many actions covers all West Coast waters and adjacent coastal communities involved in fishing. This makes it difficult to identify minority and low-income populations that may be disproportionately affected.

Section 8.5 in Appendix A (PFMC, 2005) describes a methodology, using 2000 U.S. Census data, to identify potential "communities of concern" because their populations have a lower income or a higher proportion of minorities than comparable communities in their region. West Coast ports identified in the PacFIN database were examined in this way. These ports were evaluated using five criteria: the percentage nonwhite population, percentage Native American population, percentage Hispanic population, average income, and the poverty rate. Data were evaluated for both census places and census block groups corresponding to the area around these census places. The values for these statistics were compared to the average value for one of three regions, covering coastal block groups in Washington, Oregon, and northern California; central California; and southern California. For each of the five statistics potential communities of concern were identified. These are communities that have a significantly higher percentage minority population and poverty rate or lower average income than the surrounding reference region.

About two-thirds of the port communities analyzed are above the cutoff threshold for one or more of the statistics, measured either by the census place value or the equivalent block groups. This suggests that additional criteria need to be applied to more realistically identify which ports should be of concern. It should be noted that the population affected by the proposed action, which would be predominantly fishers and those involved in allied industries (e.g., marine supplies, fish processing, recreational charter and equipment) is a small percentage of the population in most communities. It stands to reason that in larger communities and more urban areas, fishery participants are a smaller and potentially less representative component of the population. In isolated rural communities there are usually fewer alternative employment alternatives, making it harder to find work or switch from one occupation to another in response to changes in one economic sector such as fisheries. Given these conditions, another criterion to focus on communities of concern would be population size and urbanization. Eliminating ports with a population greater than 50,000 and of those ports with a population less than 50,000, those for which the block group area is more than 75% urban leaves the following ports as potential communities of concern:

It should be noted that fishery participants usually make up a small component of the population and fisheries may be a small part of the local economy in many places. Thus, even if a community has a high proportion of minority or low income residents, these people might not participate in fisheries and are thus minimally affected by the proposed action. Furthermore, within the affected population some segments are more likely to be low income and minority than others. For example, employees in a fishing processing plant may be predominantly from a minority group, and crew on vessels are likely to have a lower earnings than the skipper or vessel owner, making them more likely to be low income. Unfortunately, the kind of detailed population data necessary to determine the characteristics of the population affected by the proposed action are not available. For this reason, the ports identified in Table 7-48 represent an initial screening. Note that Moss Landing, Port Orford, Neah Bay, and Winchester Bay are also described as "vulnerable communities" (see 7.1.5.2.3).

7.2 The Economic Impacts of the Alternatives

7.2.1 Introduction

7.2.1.1 Criteria Used to Evaluate Impacts

When an agency is evaluating reasonably foreseeable significant adverse effects, there is incomplete or unavailable information, and the costs of obtaining it are exorbitant or the means unknown, the agency must (1) so state, (2) describe the importance of the unavailable information to the assessment, (3) summarize any existing scientific information, and (4) evaluate impacts based on generally accepted scientific principals, which may accord with the best professional judgment of agency staff (40 CFR Part 1502.22). NMFS acknowledges that the information necessary to fully evaluate net national benefits associated with socio-economic impacts described below cannot be reasonably obtained at this time. Available information includes historic data on commercial vessel landings and exvessel revenue gleaned from fish tickets, projections of limited entry trawl vessel participation (landings and revenue) under the alternatives provided by the GMT's trawl bycatch model, rough projections of nontrawl fisheries response (landings and revenue) under the alternatives produced by the Council's commercial fisheries data model, tribal fisheries projections (landings and revenue) under the alternatives provided by the GMT, estimates of recreational angler trips in recent years and under the alternatives provided by the GMT, and estimates of local personal income and employment impacts resulting under the alternatives generated using the Council's commercial and recreational fisheries economic assessment models (FEAM)[1/].

Additional information that is necessary to perform the required net benefits analysis includes production cost information for vessels; production cost, product volume and price information for processors; trip cost, trip volume and price information for charter operators; and angler willingness to pay information for recreational fishing experience. As noted below, efforts are underway to collect representative production cost information from participating commercial fishing vessels. However that information will not be available in time for use in this analysis, nor will the other information mentioned in this paragraph. Therefore the following evaluation is based on best professional judgment of NMFS and Council staff.

7.2.2 Commercial Fisheries

Changes in exvessel revenue are used to indicate the directions of change expected in net economic benefits derived from harvest by the commercial seafood vessels. Subgroups of the groundfish fleet are examined to determine if any particular group is experiencing greater effects than others. The primary divisions are between the limited entry trawl, limited entry fixed gear and open access fishery.

A complete assessment of the expected change in net revenue requires an assessment of changes in fishing costs[1/]. Comprehensive information on fishing costs for the West Coast groundfish fishery is not currently available. An effort is underway by NMFS and PSMFC to fill this gap by collecting data on fixed and variable cost structures of vessels engaged in groundfish and other major West Coast fisheries. A simple analysis of expected change in vessel cost structure associated with implementation of selective flatfish trawl fishery is included. Changes in operational flexibility resulting from regulatory constraints will be addressed qualitatively as an indicator of impacts on production costs. Effects on human health and safety will be discussed primarily in terms of the effect of revenue changes on vessel maintenance and the effect of changes in the RCA on travel distances to fishing ports.

The discussion of cumulative impacts will include the effects of the trawl vessel buyback program and possible future implementation of an ITQ program. These regulatory changes will be discussed in terms

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1/ FEAM includes estimates of industry (commercial vessels, processors and recreational angling businesses) cost and output parameters that have been adopted from informal surveys over the past 20 years. The Council's economic modeling methodologies are discussed in Appendix D of 2005-2006 EIS.

2/ In order to estimate net economic benefits, fishing costs must be adjusted by appropriate shadow prices to determine real opportunity costs. For example, expenditures for crew would not count as an economic opportunity cost if the labor would otherwise have been unemployed. Or if the labor would have been employed, but at a lower wage, then the difference between the wages in the fishery and the wage in the next best alternative employment would not be counted as an economic cost (i.e., only the next best available wage is counted as a cost).

of their likely effects on vessel revenue and operational costs. Changes in revenue will also be used as an indicator of the magnitude of likely harvest pressure that may affect adjacent fisheries as a result of changes in opportunity in the groundfish fishery.

7.2.3 Buyers, Processors, and Seafood Markets

Due to the lack of data on prices, costs and profitability of buyers and processors, much the same indicators as used for the harvesting sectors are used for comparing impacts on the buyer/processing sector. Specifically, as a proxy for profits, exvessel revenue is used as an indicator of activity level. From the buyer's' perspective, exvessel revenue represents expenditures for a primary production input. Projected change in exvessel revenue under the alternatives can be stratified by different categories to examine impacts by buyer/processors' relative size and level of involvement in or dependence on groundfish purchases.

Substitutability of other products, or the same product imported from elsewhere, greatly affects regional seafood markets. Flatfish are generally lower priced than rockfish, and production is more constrained by markets than by availability of the resource itself. Rockfish are higher priced in West Coast fresh markets. However, similar products from South America, Mexico, Canada, and Alaska readily substitute for West Coast production. Whiting, which is processed into surimi, a generic fish product, competes with other sources of supply such as Alaska pollock.

7.2.4 Tribal Fisheries

The criteria used to compare 2005-2006 management alternatives for the tribal groundfish fisheries are total annual projected groundfish landings and resulting exvessel revenue.

7.2.5 Recreational Fisheries

7.2.5.1 Private Recreational Anglers

Recreational experiences generate economic value for individual anglers, as determined by their willingness to pay for the experience. The sum of anglers' net willingness to pay (minus actual expenditures) represents the net economic value contributed by the recreational fishery to the national economy. However estimates of these parameters are not currently available. As a proxy, partial estimates of the change in total trips and indicators of the probable direction and degree of change in the average value per trip are considered. The following discussion highlights some of the issues involved in estimating the net economic value of the recreational fishing experience.

7.2.5.1.1 Estimating Net Economic Value

The net value of a recreational fishing trip is a function of the willingness of potential anglers to pay for the experience.[1/] While expected catch (species, number and size) probably doesn't affect the value of a

3/ Arguments that might be used to estimate willingness to pay include, among others, attractiveness of the location and distance traveled by the fisher.

trip once it is undertaken, it may affect the likelihood of taking a given trip in the first place. Reduced bag limits, while reducing the number of trips per time period, may also allow for a longer season and an increased total number of angler trips. This could provide angling opportunities to a greater number of anglers, potentially increasing the marginal value of each fish. While the marginal value per angler of each additional fish caught decreases with increasing bag limits, so too does the cost per unit of catch. So the net effect of a change in bag limit on the value of recreational experiences is ambiguous.

While a loss of fishing opportunity may translate into a direct reduction in trip-related expenditures, the resulting change in net economic value will be considerably less than the change in expenditure. Presumably the recreationalist will still pursue another activity, even though this alternative experience may be somewhat inferior than what the person originally had in mind. Substitution of one activity for another in time and/or place may still involve a similar level of expenditures, although not of the same kind or necessarily in the same place. While analysis of the local impact would interpret the reduction in revenue of the recreational fishing-related businesses as a direct loss in local income, analysis of net economic value would treat only the difference in the intrinsic value to the individual between the two types of experience as a net change in value.

An ideal model would allow us to measure the effect on total recreational effort (quantity and location of trips) and marginal value per trip resulting from changes in different management variables. Unfortunately, the data to populate such a model are lacking because the specific surveys to collect the required data have not been done.

7.2.5.1.2 Change in Recreational Effort

Conceptually, effort may change in response to caps on total landings (although if a cap is non-binding it may have no direct effect), change in seasons, or change in area or depth closures. Estimates of the change in the number of angler trips in each state's recreational ocean fishery under each management alternative are derived. Also considered are the proposed closure periods compared with the seasonal effort pattern observed, and the effect of shifts in the inshore closed area under the alternatives.

It should be noted that these estimates probably do not adequately project the effect of management changes on the distribution of effort, nor do they incorporate the impact of other changes on demand for recreational fishing experience. However this is the best available approach for evaluating impacts given the data limitations.

7.2.5.1.3 Change in Quality (Value) of Trips

Management measures may affect the perceived value of the recreational experience as well as the amount of effort. Those anglers forced to change their desired fishing patterns will probably experience a reduction in economic value from the trip. While change in bag limits probably does affect the decision of whether or not to fish, historically West Coast groundfish managers have observed little change in recreational effort in response to changes in bag limits. However continued reductions in bag limits would be expected to eventually lead to reduced demand and lower levels of angler participation once some critical threshold had been crossed.

7.2.5.1.4 Change in Quantity of Trips

Greater restrictions (e.g., lower bag limits) on individual trips may allow a greater number of anglers to fish by spreading the recreational harvest out over a longer season. However if current bag limits are constraining retained catch, then lower bag limits may also reduce the likelihood that a given individual will choose to go fishing in the first place. An increase in the number of trips results in increased total expenditures by recreational anglers. However, especially in the short term, these expenditures may represent dollars taken away from other places and other types of activities rather than "new" activity. Therefore even though net benefits may be unchanged, there may be a redistribution of expenditures among local businesses.

7.2.5.2 Charter Boat Businesses

Demand for charter trips is affected by some of the same factors that affect demand for private recreational fisheries, including bag limits, weather conditions during open seasons, and coincidental timing of open seasons with traditional vacation periods. For example, a closure during the months of July and August, the peak summer vacation period, will have a more adverse impact on charter operators than will closures during any other two-month period of the year. Impacts on charter boats under the alternatives are assessed based on estimated changes in total effort and timing of closure periods.

7.2.6 General Public

Directly measuring individuals' nonconsumptive and nonuse values for a marine resource is beyond the scope of this analysis. The metric used as a proxy is relative size of the RCAs. At current relative biomass levels for sensitive fish species this measure is assumed to be proportional to enhanced nonconsumptive and nonuse values.

7.2.7 Communities

Impacts on communities will be assessed according to the commercial and recreational impacts described below. "Vulnerable" communities will be also discussed.

7.2.7.1 Commercial Fisheries and Recreational Impacts

Projected commercial landings under the alternatives are compared against recent landings to estimate change in landings by port area. Income multipliers generated by the FEAM and differentiated by species, vessel category, gear type, processing mode, and landing port are applied to the projected landings to estimate change in total personal income impacts resulting from the estimated change in harvest and processing activity under each alternative. A description of FEAM is found in {Jensen 1996}. A recent update to the model is described in {Davis 2003}. Also see Appendix D of the 2005-06 EIS for further discussion of income impact estimating methodology. These impacts will be reviewed against the list of "vulnerable communities as described above." Annual recreational fishing effort under the alternatives is estimated by region and compared against recent data. Change in effort is assumed to be roughly proportional to the change in estimated harvest. Regional income multipliers derived from the recreational FEAM, and average trip expenditures for recreational fishers in the four regions derived from a recent study {Gentner 2001} are applied to the estimated change in effort to generate the change in regional income resulting from the level of recreational fishing activity expected under each alternative.

7.2.7.2 Community Vulnerability

The commercial and recreational impacts will be compared against the list of "vulnerable" communities and "communities of concern"—see discussion under 7.1.5.2.

7.2.7.3 Safety

Changes in vessel net income can have effects beyond economic effects. Reduced investment in maintenance and safety equipment can increase hazard associated with fishing. Reduced income opportunity could cause dislocation for crew members and their families. Individuals willing to work for lower paying jobs are generally less skilled and have fewer alternative employment opportunities. In addition to reduced operational efficiency, these factors could lead to deterioration in vessel safety conditions.

Safety of fishing vessels is also affected by the seasons and depth zones or areas open to fishing under the alternatives. Seasonal closures that push commercial and/or recreational vessels out to sea during poor weather months will increase the likelihood of safety problems for those vessels.

RCA boundaries and depth or area closures that pack vessels into shallow nearshore areas will also increase the likelihood of safety problems. Limits that push commercial and recreational fleets to fish in the same waters increase the risk of collisions, especially in bad weather. Recreational boaters tend to be less experienced and have less safety equipment than commercial skippers, and are often unfamiliar with bottom contours, wave dynamics, tides, and currents. This combination of increased vessel density, the inherent risks of navigating shallow waters, and relatively inexperienced skippers, increases the risks to vessels.

Effects on vessel safety under the alternatives are evaluated by comparing revenue earning opportunities for commercial vessels, and the pattern of season and depth/area closures for both commercial and recreational vessels.

7.2.7.4 Key Impact Indicators

As discussed above assessing the impacts of the alternatives will be primarily through the prediction of changes in landings, ex-vessel revenues, and personal income impacts for commercial fisheries. Total estimates are provided by Alternative and then by sector and community (e.g. Shoreside Limited Entry Trawl, Astoria Tillamook) and by state. For recreational fisheries, the key indicators are trips, angler expenditures and income impacts. In evaluating the alternatives, two different approaches are undertaken. The first approach attempts to develop ex-vessel impact estimates on a on a finer scale with respect to gear groups and fisheries than the second approach. The second approach provides information on personal income and other variables. Both discuss recreational fisheries

First Approach –A: Commercial sectors are nearshore groundfish, limited entry trawl, whiting, fixed gear sablefish north of the Conception area, fixed gear south of Point Conception, and Total. The First Approach uses 2005 as a reference point. Whereas the Second approach uses the No-Action Alternative as a reference point.

Second Approach –B: Commercial sectors are Limited Entry trawl (including or excluding whiting), tribal shoreside, tribal at sea, open access groundfish, and total limited entry sablefish.

The methodology and groupings of tribal and commercial sectors differs slightly between each approach, but recreational fisheries are analyzed the same way. Approach B provides commercial estimates and projections by alternatives on landing, revenues, and personal income and recreational estimates and projections of trips, angler expenditures, and personal income. Approach A provides estimates of ex-vessel values and recreational trips. Approach B provides information on a port and community basis; Approach A provides information on a regional basis. Approach A analyzes the five rebuilding alternatives discussed in Chapter 2 and brought before the Council in April. Approach B focuses only the three action alternatives, the no action alternative, and provides estimates of 05 and 06. Approach A does not address O6 or the no-action alternative; however, it does address the "No Fishing" option.

For this document, both analyses will be used. Because it addresses the link between management and economic impact, Approach A Analyses will be used to walk through the alternatives. This discussion will then be followed by a summary of the Second Approach's estimates.

Since both approaches discuss the Action Alternatives, Table 7-49 has been developed to provide the reader with a quick reference to the major changes in OYs from 05-06 levels.

7.2.8 Economic Impact of Management Measures Designed to Achieve the OY Alternatives—Discussion of Approach A

This section discusses the economic impact of management measures that were designed and analyzed with the intention of achieving the OYs described in chapter 2 of this EIS. The alternatives discussed in chapter 2 show a set of alternatives originally considered during the winter of 2006 which led to the council's selection of preliminary preferred alternatives for target species, and a high and low preliminary preferred alternative for rebuilding species. The initial set of OY alternatives pertaining to overfished species described in chapter 2 are referred to here as "rebuilding alternatives" and the second set of alternatives that were selected by the council during the April 2006 meeting are referred to as "preliminary preferred alternatives" or "action alternatives". The action alternatives focus on the council's preliminary preferred OYs for target and rebuilding species. While the council may continue to consider, and ultimately adopt, one or more of the rebuilding alternatives not considered a preliminary preferred alternative, this analysis concentrates on the action alternatives based on the notion that the council has given an indication as to what OYs it feels are close to those it wishes to adopt.

7.2.8.1 Overview

The OYs for target and rebuilding species differ from 2005 and 2006 OYs. In some cases these differences are substantial, and in other cases the difference in minimal. The relative OYs of target and rebuilding species ultimately influences the management measures that are crafted in response to those OYs, and estimates of exvessel revenue, recreational effort, and the distribution and source of those economic effects differ in response.

For the 2007 and 2008 season, the OY of several key target species will differ relative to the 2005 and 2006 season. The OYs for Dover sole, English sole, and shortspine thornyheads will increase substantially based on the council's preliminary preferred alternative (Table 7-49). In response, management measures could be crafted which allow fisheries to harvest more of these species, however, the take of these target species is constrained by rebuilding species, and in some cases, other target species. Some target species will have a decrease in the OY compared to the OYs that were in place for 2005 and 2006. Petrale sole and sablefish for example will have a 22% and 10% reduction respectively, and these OYs are expected to constrain the take of other target species to some degree under the council's preliminary preferred alternatives 2 and 3.

The OY for rebuilding species differ from 2006. Under action alternative 1, all OYs are reduced compared to 2006 levels. Under action alternative 2 and 3, the OY of most overfished species are reduced compared to 2006 levels, but the OY for widow, cowcod, and darkblotched would increase. However, the OY for darkblotched is equivalent to 2006 levels when the OY is measured relative to the size of stock biomass, and analysis shows that this OY is expected to constrain some fisheries more than the 2006 OY based on expectations pertaining to increases in the bycatch rate of darkblotched.

Table 7-49 provides information on the difference and change in OYs for rebuilding species and some of the key target species. This information is useful for showing why exvessel revenue can change under some of the alternatives, the source for those changes, and insight into some of the management responses anticipated to stay within the OY that is ultimately adopted by the council.

A summary comparison of exvessel revenue calculations by sector and alternative provides a glance of the economic impacts of each alternative (Table 7-50). Compared to coastwide 2005 exvessel revenues generated by commercial vessels in directed groundfish sectors, action alternative 3 has the least degree of difference, action alternative 1 has the largest degree of difference, and action alternative 2 is best described as more moderate. The five rebuilding alternatives originally analyzed range from exvessel revenues that are slightly higher than status quo, to revenues that are slightly lower than action alternative 1. On a sector specific basis, all alternatives negatively impact the fixed gear sablefish sector because the OY for sablefish is lower in 2007 and 2008 compared to 2005 and 2006. The nearshore groundfish sector is most impacted by action alternative 1, least impacted by action alternative 3, and more moderately impacted by action alternative 2. The LE bottom trawl sector is most impacted by action alternative 1, has slightly higher revenues than status quo under action alternative 2, and even higher revenues under action alternative 3. The LE whiting sector is most negatively impacted by action alternative 1, but action alternative 3 allows this sector to attain higher revenues than status quo if the whiting OY allows those catch levels to be attained4. Action alternative 2 constrains the whiting sector to revenues that are somewhat less than status quo. Fixed gear fisheries south of point Conception are negatively impacted by action alternative 1, but remain at status quo for action alternatives 2 and 3.

Table 7-51 does a similar analysis for recreational fisheries. Action Alternative 3 leads to an increase in recreational effort over 2005 levels while Action Alternative 1 shows a 35 % decline in angler trips and Alternative 2, a 22% decline.

7.2.8.2 Action Alternative 1

Action alternative 1 reduces overfished species OYs compared to status quo catch levels, and as a result, revenues generated by commercial and recreational fisheries are reduced compared to 2005 levels. Under this alternative, many of the target species OYs are not attained, and fishing area is decreased for all sectors as the size of groundfish conservation areas is expanded to encompass more area where

4 The Pacific whiting ABC and OY levels are estimated and adopted by the Council in the spring of each year.

overfished species are found. While groundfish conservation areas are a useful tool for protecting overfished species while allowing fishing opportunity where those same overfished species are less abundant, having less fishing area makes it more difficult to access target species in many cases, and may also increase the cost of traveling to areas remaining open.

7.2.8.2.1 Impacts to Limited Entry Bottom Trawl

The impacts to the non-whiting limited entry trawl sector under action alternative 1 are largely driven by the OYs for canary rockfish, bocaccio rockfish, darkblotched rockfish, cowcod, and Pacific ocean perch. While the OYs for yelloweye and widow rockfish are also reduced under action alternative 1, the non-whiting limited entry trawl sector does not encounter these species to the same degree as other sectors and therefore the management measures crafted for this sector are not driven by those species.

Regulations for the non-whiting limited entry trawl sector include an expansion of the trawl rockfish conservation area compared to status quo, and a decrease in cumulative limits for target species compared to status quo. Of particular note, this alternative puts in place a 250 fathom seaward boundary in the northern areas (north of 40° 10 minutes N latitude) for the entire year, a 200 fathom seaward boundary in the area between 40° 10 minutes N latitude and 38° N latitude for the entire year, and a 60 fathom shoreward boundary for areas south of 40° 10 minutes N latitude for most of the year. This is a noticeable reduction in fishing area compared to 2006 configurations.

Cumulative limits for target species under this alternative are reduced for all of the major target species including Dover sole, sablefish, thornyheads, other flatfish, arrowtooth flounder, and petrale sole. As a result, none of the OYs for major target species are attained under this alternative.

The combined effect of area closures and reductions in cumulative limits results in a decrease in exvessel revenues from the no-action alternative. Exvessel revenues to this sector are approximately 59% of 2005 levels, representing a decrease of approximately 41% (Table 7-50). Table 7-52 shows projected revenues by two month period.

7.2.8.2.2 Impacts to the Limited Entry Whiting Trawl Fishery

The impacts to the limited entry whiting trawl sector under action alternative 1 are largely driven by the OYs for canary rockfish, widow rockfish, and to a lesser extent, darkblotched rockfish and Pacific ocean perch. Other species are not caught in the whiting sectors to the same degree as other sectors, so management measures necessary to protect species such as bocaccio, yelloweye, and cowcod do not influence the whiting fishery to the same degree as other sectors.

While many sectors benefit from the use of groundfish conservation areas, or more specifically, the rockfish conservation areas, it is estimated that the whiting sector would not benefit as much from imposing a rockfish conservation area in the same manner as the bottom trawl sector. Depths restrictions necessary to achieve reductions in the catch of canary, widow, darkblotched, and POP are generally the same depths where Pacific whiting are found and caught effectively. Closing these areas would also eliminate the ability to target whiting effectively, except in the years of largest whiting abundance when the population is spread more densely over a wider range of depths. Therefore, the most effective means of reducing the bycatch of overfished species in this sector while continuing to allow a fishery is likely to be a decrease in the amount of whiting catch allowed to the commercial sectors. Assuming the whiting sector is allowed to take the same percentage of the widow, canary, darkblotched, and POP OYs as under the 2005 and 2006 fisheries, it is estimated that the commercial catch amounts and exvessel value of Pacific whiting would decrease by 42.5% (Table 7-50) Table 7-53 shows projected revenues by two month period.

7.2.8.2.3 Impacts to Nearshore Groundfish Fisheries

Economic impacts to the nearshore groundfish sector are largely driven by canary and yelloweye rockfish. In areas south of 40° 10 minutes N latitude, observer data has not shown an interaction with yelloweye rockfish, so in these areas, canary rockfish is the driving constraint. Action alternative 1 brings the nearshore groundfish sectors in to depths less than 20 fathoms for the entire year. Depth restrictions are regarded as a useful tool for managing the catch of overfished species in the nearshore groundfish sectors while allowing fishing of healthy target species, however, imposing a more restrictive depth restriction is expected to result in some reduction in the catch of target species as some nearshore target species are not as available at depths less than 20 fathoms. Although some reduction in the catch of target species is expected from a 20 fathom restriction, additional reductions on some of the lesser valued target species are were analyzed under this alternative to achieve the necessary reductions in the bycatch of canary and yelloweye rockfish. Analysis of alternative 1 shows that exvessel revenues are expected to decline by approximately $450,000 from 2005 levels which represents a decrease of approximately 16.5% (Tables 7-50, 7-54).

7.2.8.2.4 Impacts to Fixed Gear Sablefish Sectors North of 36° North Latitude

Economic impacts to the fixed gear sablefish sectors are largely driven by yelloweye and, to a lesser extent, canary rockfish. Management measures designed to reduce the bycatch of these species in the fixed gear sablefish sectors are limited to depth restrictions of varying degrees of restrictiveness depending on the alternative. Changes in the catch of sablefish which are lower than the OY are not considered in the management measures which pertain to reductions in the catch of overfished species because under all alternatives the sablefish OY is reduced compared to 2005 and 2006 levels, and this reduction achieves reductions in the bycatch of overfished species on it's own. The reduction in the sablefish OY occurs as a result of the 2005 sablefish stock assessment, and the council's policies regarding species that fall within the precautionary zone (sablefish is a precautionary zone species).

While exvessel revenues are expected to be the same across all action alternatives ($8.7 million, Table 7-50), action alternative 1 is expected to have a substantial impact to vessels that home port near the northern Washington coast and Puget Sound. Under action alternative 1, the fixed gear sablefish sectors would be restricted to fishing deeper than depths of 150 fathoms, and off the northern Washington coast, the 150 fathom line closes off most of the fishing grounds currently used by those vessels. Imposing a 150 fathom line would require vessels that home port in the northern Washington ports and Puget Sound ports to travel much further distances to reach fishing grounds. This may result in increased travel cost, or some vessels may choose to change their homeport, thereby affecting processors and support businesses relying on vessels in their current home ports in the northern Washington coast and Puget Sound.

7.2.8.2.5 Impacts to Groundfish Fixed Gear Sectors South of 34° 27 North Latitude

The economic impact to fixed gear fisheries operating south of point Conception are largely influenced by the OYs for bocaccio and cowcod. Depth restrictions are viewed as an effective mechanism for achieving reductions in the bycatch of overfished species in this area (primarily bocaccio and cowcod), however depth restrictions are likely to reduce the catch of target species as well since vessels in this area occasionally target species that are found in areas proposed to be closed under action alternative 1. Under status quo management measures, vessels can fish at depths less than 60 fathoms or more than 150 fathoms. Under action alternative 1, vessels would be restricted to fishing shallower than 40 fathoms or deeper than 180 fathoms. Based on the relative abundance of the main target species in the area across those depths, imposing a shoreward boundary of 40 fathoms and a seaward boundary of 180 fathoms is expected to reduce exvessel revenues by approximately $620,000, or approximately 29% compared to 2005 revenues (Table 7-50).

7.2.8.2.6 Impacts to Recreational Sectors

The impact to recreational sectors under action alternative 1 are driven by the OY for yelloweye rockfish and canary rockfish. The yelloweye rockfish OY under this alternative represents a substantial decrease in the OY from status quo levels, and management measures designed to achieve catch levels that meet this reduction in the OY are sufficient to achieve the necessary reductions in the canary rockfish OY. Management measures used to achieve the reductions in the bycatch of yelloweye rockfish include restricting recreational fisheries to 10 and 20 fathoms, reduced bag limits for target species, and shorter seasons. The coastwide impact of these management measures results in a 35% decline in recreational bottomfish fishing effort (Table 7-51).

7.2.8.3 Action Alternative 2

Action alternative 2 brings overfished species OYs to levels that are near status quo catch amounts for many overfished species except for yelloweye rockfish. When applying the portion of the OY currently being caught by status quo catch levels to the predicted biomass of overfished species in 2007 and 2008, the OYs for some overfished species under action alternative 2 are even closer to status quo catch levels. While OYs for overfished species are near status quo, negative economic impacts are less than alternative 1, but more restrictive than action alternative 3. The result is a larger portion of the OY that remains unattributed to any particular sector5.

While many of the OYs for overfished species are not attained under this alternative, coastwide exvessel revenues are estimated to be higher for many sectors of the fishery as the population of target species such as Dover sole and petrale sole increase and become more widely found in the fishery (Table 7-50).

7.2.8.3.1 Impacts to the Limited Entry Bottom Trawl Fishery

The impacts to the non-whiting limited entry trawl sector under action alternative 2 are largely driven by the OYs for canary rockfish, bocaccio rockfish, darkblotched rockfish, cowcod, and Pacific ocean perch.

Regulations for the non-whiting limited entry trawl sector under this alternative mostly include an expansion of the trawl rockfish conservation area compared to status quo. While catch levels of overfished species are predicted to be close to status quo in this sector for many overfished species, it is predicted that the bycatch of several overfished species, darkblotched rockfish in particular, will increase over time and that rate of increase is sufficient to warrant increasing restrictions on the fishery to stay within the OY. Exvessel revenues for the bottom trawl sector are predicted to be marginally higher compared to status quo, however, the distribution of impacts is likely to be different than status

5 see chapter 2 scorecards which estimate catch of overfished species by sector and alternative.

quo. Under this alternative the rockfish conservation area boundaries are set at deeper depths for some periods of the year when compared to status quo, and this has impacts on vessels that are less able to fish at deeper depths because some vessels may be unable to fish in these areas, vessels may need to travel further to fishing grounds, or additional vessels may choose to fish in the nearshore areas, thus impacting small trawl vessels that routinely fish nearer to the shore. Table 7-55 provides projections of revenues by region and two month period. (Note there are no Tables 56 or 57)

7.2.8.3.2 Impacts to the Limited Entry Whiting Trawl Fishery

The impacts to the limited entry whiting trawl sector under action alternative 2 are largely driven by the OYs for canary rockfish and widow rockfish. While many sectors benefit from the use of groundfish conservation areas, or more specifically, the rockfish conservation areas, it is estimated that the whiting sector would not benefit as much from imposing a rockfish conservation area in the same manner as the bottom trawl sector. Depths restrictions necessary to achieve reductions in the catch of canary, widow, darkblotched, and POP are generally the same depths where Pacific whiting are found and caught effectively. Closing these areas would also eliminate the ability to target whiting effectively, except in the years of largest whiting abundance when the population is spread more densely over a wider range of depths. Therefore, the most effective means of reducing the bycatch of overfished species in this sector while continuing to allow a fishery is likely to be a decrease in the amount of whiting catch allowed to the commercial sectors. Assuming the whiting sector is allowed to take the same percentage of the widow, canary, darkblotched, and POP OYs as under the 2005 and 2006 fisheries, it is estimated that the commercial catch amounts and exvessel value of Pacific whiting would decrease by 22%. Table 7-58 shows projected revenues by two month period.

7.2.8.3.3 Impacts to Nearshore Groundfish Fisheries

Economic impacts to the nearshore groundfish sector are largely driven by canary and yelloweye rockfish. In areas south of 40° 10 minutes N latitude, observer data has not shown an interaction with yelloweye rockfish, so in these areas, canary rockfish is the driving constraint. Action alternative 2 brings the nearshore groundfish sectors in to depths less than 20 fathoms for the entire year. Depth restrictions are regarded as a useful tool for managing the catch of overfished species in the nearshore groundfish sectors while allowing fishing of healthy target species, however, imposing a more restrictive depth restriction is expected to result in some reduction in the catch of target species as some nearshore target species are not as available at depths less than 20 fathoms. While some reduction in target species catch is expected under this alternative, the catch of yet other target species that are available at these depths can be increased under this alternative compared to status quo and the impact of increasing the catch of these target species is a slight increase in exvessel revenues. Analysis of alternative 2 shows that exvessel revenues are expected to increase by approximately $90,000 from 2005 levels, but revenues are expected to decrease in the northern areas while increasing in the southern areas (Table 7-59).

7.2.8.3.4 Impacts to Fixed Gear Sablefish Sectors North of 36° North Latitude

Economic impacts to the fixed gear sablefish sectors are largely driven by yelloweye and, to a lesser extent, canary rockfish. Management measures designed to reduce the bycatch of these species in the fixed gear sablefish sectors are limited to depth restrictions of varying degrees of restrictiveness depending on the alternative. Changes in the catch of sablefish which are lower than the OY are not considered in the management measures which pertain to reductions in the catch of overfished species because under all alternatives the sablefish OY is reduced compared to 2005 and 2006 levels, and this reduction achieves reductions in the bycatch of overfished species on it's own. The reduction in the sablefish OY occurs as a result of the 2005 sablefish stock assessment, and the council's policies regarding species that fall within the precautionary zone (sablefish is a precautionary zone species).

While exvessel revenues are expected to be the same across all action alternatives ($8.7 million, Table 7-50), action alternative 2 could have a relatively large impact to vessels that home port near the northern Washington coast and Puget Sound. Under action alternative 2, the fixed gear sablefish sectors would be restricted to fishing deeper than depths of 125 fathoms in areas north of 40° 10 minutes north latitude, and off the northern Washington coast, the 125 fathom line may close off much of the fishing area currently used by those vessels. Imposing a 125 fathom line could require vessels that home port in the northern Washington ports and Puget Sound ports to travel much further distances to reach fishing grounds. This may result in increased travel cost, or some vessels may choose to change their homeport, thereby affecting processors and support businesses relying on vessels in their current home ports in the northern Washington coast and Puget Sound.

7.2.8.3.5 Impacts to Groundfish Fixed Gear Sectors South of 34° 27 North Latitude

The economic impact to fixed gear fisheries operating south of point Conception are largely influenced by the OYs for bocaccio and cowcod. While the fixed gear sectors south of point Conception encounter bocaccio and cowcod, reductions in the catch of these species necessary to stay within the OY are achieved by management measures in other sectors, and therefore, status quo management for fixed gear vessels in the area south of point Conception is sufficient to stay within the OY of overfished species.

7.2.8.3.6 Impacts to Recreational Sectors

The impact to recreational sectors under action alternative 2 are driven by the OY for yelloweye rockfish and canary rockfish. The yelloweye rockfish OY under this alternative is based on a strategy which "ramps down" catch levels from current amounts in order to give managers and industry time to adapt and develop more refined tools for decreasing the catch of yelloweye while allowing some access to healthier target species. It is anticipated that management measures designed to reduce the bycatch of yelloweye rockfish will also result in reductions of canary rockfish, and therefore, management measures which are motivated by reductions in the yelloweye OY are expected to be sufficient to achieve the necessary reductions in the canary rockfish OY. Management measures used to achieve the reductions in the bycatch of yelloweye rockfish include restricting recreational fisheries to varying depth restrictions, imposing site-specific area closures where industry and available data suggests yelloweye are found, and bag limits for target species which don't allow attainment of target species OYs. The coastwide impact of these management measures results in a 22% decline in recreational bottomfish fishing effort (Table 7-51).

7.2.8.4 Action Alternative 3

Action alternative 3 brings overfished species OYs to levels that are near status quo catch amounts for many overfished species except for yelloweye rockfish. When applying the portion of the OY currently being caught by status quo catch levels to the predicted biomass of overfished species in 2007 and 2008, the OYs for some overfished species under action alternative 3 are even closer to status quo catch levels than action alternative 2. The overall economic impact of action alternative 3 is that many sectors are expected to be managed to levels that are similar to status quo.

7.2.8.4.1 Impacts to the Limited Entry Bottom Trawl Fishery

The impacts to the non-whiting limited entry trawl sector under action alternative 3 are largely driven by the OYs for canary rockfish, bocaccio rockfish, darkblotched rockfish, cowcod, and Pacific ocean perch. Under this alternative, the OY for petrale sole (a target species) is also expected to be attained, the OY for sablefish is expected to be nearly attained (due in large part to a decrease in the OY for sablefish), and the catch of Dover sole is expected to be higher than status quo because of the increasing abundance of this species.

Regulations for the non-whiting limited entry trawl sector under this alternative mostly include an expansion of the trawl rockfish conservation area compared to status quo. While catch levels of overfished species are predicted to be close to status quo in this sector for many overfished species, it is predicted that the bycatch of several overfished species, darkblotched rockfish in particular, will increase over time and that rate of increase is sufficient to warrant increasing restrictions on the fishery to stay within the OY. Exvessel revenues for the bottom trawl sector are predicted to be marginally higher compared to alternative 2, and higher still than status quo, however, the distribution of impacts is likely to be different than status quo. Under this alternative the rockfish conservation area boundaries are set at deeper depths for some periods of the year when compared to status quo, and this has impacts on vessels that are less able to fish at deeper depths because some vessels may be unable to fish in these areas, vessels may need to travel further to fishing grounds, or additional vessels may choose to fish in the nearshore areas, thus impacting small trawl vessels that routinely fish nearer to the shore. Table 7-60 shows projected revenues by two month period.

7.2.8.4.2 Impacts to the Limited Entry Whiting Trawl Fishery

The impacts to the limited entry whiting trawl sector under action alternative 3 are largely driven by the OYs for canary rockfish and widow rockfish, but equally driven by the ability of the whiting sectors to catch an amount of Pacific whiting which corresponds to the available OY of canary and widow rockfish. That is, under this alternative, the catch of whiting is expected to be largely unconstrained by overfished species, assuming there are no "disaster tow events" where a single tow of a trawl net catches a large amount of an overfished species. Assuming the whiting sector is allowed to take the same percentage of the widow, canary, darkblotched, and POP OYs as under the 2005 and 2006 fisheries, it is estimated that the commercial catch amounts and exvessel value of Pacific whiting would be the same as status quo, or approximately $30 million (Table 7-50) Table 7-61 shows projected revenues by two month period.

7.2.8.4.3 Impacts to Nearshore Groundfish Fisheries

Economic impacts to the nearshore groundfish sector are largely driven by canary and yelloweye rockfish. In areas south of 40° 10 minutes N latitude, observer data has not shown an interaction with yelloweye rockfish, so in these areas, canary rockfish is the driving constraint. Management measures in the nearshore fisheries under this alternative are designed to be equivalent to status quo, and therefore, exvessel revenues are expected to be the same as status quo.

7.2.8.4.4 Impacts to Fixed Gear Sablefish Sectors North of 36° North Latitude

Management measures imposed on the fixed gear sablefish sectors that are designed to reduce the catch of overfished species largely center on the impacts to yelloweye and, to a lesser extent, canary rockfish. Management measures designed to reduce the bycatch of these species in the fixed gear sablefish sectors are limited to depth restrictions of varying degrees of restrictiveness depending on the alternative. Changes in the catch of sablefish which are lower than the OY are not considered in the management measures which pertain to reductions in the catch of overfished species because under all alternatives the sablefish OY is reduced compared to 2005 and 2006 levels, and this reduction achieves reductions in the bycatch of overfished species on it's own. The reduction in the sablefish OY occurs as a result of the 2005 sablefish stock assessment, and the council's policies regarding species that fall within the precautionary zone (sablefish is a precautionary zone species).

While exvessel revenues are expected to be the same across all action alternatives ($8.7 million), action alternative 3 has the same rockfish conservation area boundaries for the sablefish sectors as under status quo, and therefore, reductions in exvessel revenue for these sectors are not driven by overfished species concerns, but are instead driven by the reduction in the OY of sablefish.

7.2.8.4.5 Impacts to Groundfish Fixed Gear Sectors South of 34° 27 North Latitude

The economic impact to fixed gear fisheries operating south of point Conception are highly influenced by the OYs for bocaccio and cowcod. While the fixed gear sectors south of point Conception encounter bocaccio and cowcod, reductions in the catch of these species necessary to stay within the OY are achieved by management measures in other sectors, and therefore, status quo management for fixed gear vessels in the area south of point Conception is sufficient to stay within the OY of overfished species.

7.2.8.4.6 Impacts to Recreational Sectors

The impact to recreational sectors under action alternative 3 are driven by the OY for yelloweye rockfish and canary rockfish. The yelloweye rockfish OY under this alternative is based on a strategy which "ramps down" catch levels from current amounts in order to give managers and industry time to adapt and develop more refined tools for decreasing the catch of yelloweye while allowing some access to healthier target species. It is anticipated that management measures designed to reduce the bycatch of yelloweye rockfish will also result in reductions of canary rockfish, and therefore, management measures which are motivated by reductions in the yelloweye OY are expected to be sufficient to achieve the necessary reductions in the canary rockfish OY. Management measures used to achieve the reductions in the bycatch of yelloweye rockfish include restricting recreational fisheries to varying depth restrictions, imposing site-specific area closures where industry and available data suggests yelloweye are found, and bag limits for target species which don't allow attainment of target species OYs. The coastwide impact of these management measures results in a 9% increase in recreational bottomfish fishing effort, though only recreational fisheries off California experience an increase in effort. Washington and Oregon are expected to achieve no change in effort under action alternative 3 when compared to status quo.

7.2.9 Net Economic Impact of Alternatives – Approach B

What follows is a walk through the tables. Table 7-62a shows projected exvessel revenue for different groupings of commercial fisheries under the alternatives, and the change in exvessel revenue relative to No Action. The table shows significant differences between the alternatives. For example, Alternative 3 has the smallest difference from No Action with a 2.7% decline associated with Alternative 3, a 10% percent decline with Alternative 2, a 37 % decline in exvessel revenues should Alternative 1 be implemented for non-tribal groundfish including at-sea vessels.

Table 7-62b shows the equivalent estimates for same groupings in terms of landed weight (thousand mt) rather than revenue while Table 7-62c does the same for comparison but using personal income impacts as the impact variable. It should be noted that "Total West Coast Landings (includes at-sea and tribal) is an estimate for all West Coast fisheries including groundfish..

Here is a list of all the commercial related tables:

7-62a Ex-vessel revenue projections by major sector
7-62b Commercial harvest projection by major sector
7-62c Commercial Income Impacts by major sector
7-63a Ex-vessel revenue projections by State, port area and major sector
7-63b Change in ex-vessel revenue projections by State, port area, and major sector
7-64a Estimated income impact projections by State, port area, and major sector
7-64b Change in estimated income impact projections by State, port area, and major sector

Recreational Fisheries Impacts

In a similar manner to those developed for the commercial fishery, the following tables have developed. Shortened titles for these tables are:

7-65a Projected recreational effort by region in 2004 and 2005 and by alternative
7-65b Change in projected effort across alternatives
7-66a Projected angler expenditures by region in 2004 and 2005 and by alternatives.
7-66b Change in projected angler expenditures across alternatives
7-67a Projected recreational income impacts by region in 2004 and 2005, and by alternatives
7-67b Change in recreational income impacts by region by alternative
7-68a Projected recreation employment impacts by region by alternative
7-68b Change in recreation employment impacts by region by area
7-68c Projected recreational Employment impacts by trip target, region, mode, state and alternative
7-68d Projected West Coast Recreational Income by state, boat type and alternative
7-68e Summary of total three State Recreational Impacts (trips, expenditures, income) by boat type and trip target.

Commercial and Recreational Fisheries Impacts Combined

7-68f Combined recreational and income impacts by region and alternative
7-68g Change in combined recreational and commercial impacts by region and alternative

7-68h Combined recreational and commercial employment impacts by region and alternative
7.59i Change in combined recreational and commercial employment impacts by region and alternative

Commercial Impact Comparison

Under the no action alternative, total West Coast landings from all fisheries including groundfish would yield 510,000 mt of fish and shellfish landed or delivered at sea, generating about $280 million in ex-vessel revenues which in turn would lead to $625 million in income impacts and at an income level of $26,000 per year would yield 24,000 jobs. The 2005 estimates are quite similar to the No-Action Alternative. However, Alternative 1 would lead to a level $567 million in personal income, roughly a 10% decrease in income impacts whereas Alternatives 3 would have less than 1% decline in income and Alternative 3, a 4% decline. For non-tribal income impacts, the No-Action and 2005 levels of personal income are about $140 million. Implementation of Alternative 1 would lead to a decline of $56 million in groundfish fishery generated income, for a 40% decline in the groundfish fishery. Alternative 2 would lead to a 15% decline in Non-tribal income impacts including at-sea fisheries and Alternative 1, 2 percent decline.

Recreational Impact Comparison

It is estimated that under the no Action Alternative, 1.2 million angler trips would be taken and the estimated $113 million that these anglers would spend on fishing would generate, $89 million in personal income or the equivalent of 3,422 jobs. These estimates are similar to the ones generated for 2005 but differ significantly with Alternative 1. Under Alternative 1, one million trips would be undertaken leading to $92 million in expenditures, 73 million in income and 2,802 jobs. A difference of $16 million or 18 percent decline. These estimates are for all fisheries including groundfish.. With respect to groundfish targeted trips, the No action alternative leads to $40 million in personal income impacts compared to a 2005 level of $35 million. If Alternative 1 were implemented, the recreational groundfish fishery would generate $25 million, approximately a 30 percent decline. Alternative 3 would generate $45 million in personal income impacts and Alternative 2, $30 million in impacts.

7.2.10 Other Management Measure Analyses

7.2.10.1 Economic Impacts of Management Measures Designed to Reduce the Mortality of Yelloweye Rockfish

The 2002 yelloweye stock assessment was more optimistic than the 2006 stock assessment. The 2006 stock assessment estimated biomass – or status of the stock – to be at a 17.7% depletion level (percent of unfished biomass), and the 2002 assessment estimated the depletion level to be 24%. This does not mean that the population has been declining, only that the re-estimated stock size is smaller than previously thought. While the difference in the depletion level between the two assessments was a difference of approximately 6.3%, one of the more major changes to the stock assessment pertains to the assumed life history characteristics of yelloweye. The characteristics used in the 2002 rebuilding analysis resulted in estimates that showed the species to be more productive than the 2006 assessment. The result of findings and assumptions used in the 2006 assessment means that the estimates from the

2002 assessment allowed for shorter rebuilding times and/or larger harvests when compared to the 2006 assessment. For example, the 2006 OY for yelloweye was set at 27 metric tons, and the results of the 2002 rebuilding analysis estimated that the stock would be rebuilt by 2023 under the SPR harvest rate that corresponds to a 27 metric ton OY in 2006. Estimates from the 2006 assessment, show that a 2007 OY of 12 metric tons would rebuild the stock in 2078. That is, if the council and NMFS adopted a 66% reduction in the yelloweye OY compared to status quo, the rebuilding period would still be 55 years longer than the previous T_{TARGET}, and 30 years longer than $T_{F=0}$.

This dramatic change in the assessment results will have dramatic implications to management measures designed to protect yelloweye rockfish. Management measures ultimately adopted will likely need to result in a smaller harvest of yelloweye than previous measures, and such management measures will also have negative economic consequences to fishing communities. Under status quo management, the sectors that take the largest amount of yelloweye rockfish are the recreational groundfish and halibut sectors, followed by directed open access groundfish, and limited entry fixed gear and tribal sectors. In order to achieve reductions in the bycatch of overfished groundfish, the council has, in the past, restricted to the greatest extent those sectors that have the largest impact on that particular species. However, in many instances the tribal fisheries are left unaffected. Based on past approaches to management, the largest source of reduction in yelloweye rockfish bycatch is likely to come from the recreational and directed open access sectors. At the end of 2005, the recreational sectors were estimated to take 13.1 metric tons of yelloweye, and all other sectors (including tribal and non-groundfish fisheries) were estimated to take 8.9 metric tons.

Several alternatives were analyzed pertaining to yelloweye rockfish OYs. These OYs include zero harvest, a 2007 OY of 12 mt, 12.6 mt, 17 mt, 21 mt, 24 mt, 27 mt, and a ramp-down strategy which has a 2007 OY of 23 mt, 20 mt in 2008, 17 mt in 2009, and 14 mt in 2010 respectively. Implicit in the ramp down strategy is the development of additional management tools in order to allow some harvest of more abundant target species while reducing the catch of yelloweye over time. It is likely that new management tools would not be able to be developed without a ramp-down strategy because the development of additional tools inherently relies on some additional bycatch in order to test the effectiveness of those tools.

7.2.10.1.1 Economic Impact of a $T_{F=0}$ Yelloweye OY

Under the zero harvest alternative ($T_{F=0}$), the cost to the fishing industry is expected to be substantial. The $T_{F=0}$ harvest alternative is estimated to result in a loss of over $100 million in exvessel revenues and approximately 1,150,000 recreational angler trips. These figures represent a complete closure of multiple sectors including, but not limited to, all bottom-tending commercial fishing gears (outside of selective gears like dive gear) for groundfish species, shrimp species, and other bottom dwelling species like Pacific halibut, California halibut, and sea urchins; the complete closure of Chinook salmon troll fisheries; the complete closure of tribal groundfish fisheries; and the complete closure of recreational fisheries for groundfish, Pacific halibut, and Chinook salmon. This alternative is expected to have substantial negative economic consequences to communities, and these closures would be in place until 2048 – the year yelloweye is estimated to be rebuilt.

7.2.10.1.2 Economic Impact of a 12 metric ton Yelloweye OY in 2007

Under the alternative which puts in place a 12 metric ton yelloweye OY in 2007, multiple sectors and communities are estimated to be negatively impacted to a large degree. Analysis of commercial management measures designed to achieve a suite of OYs for all overfished species which included the

12 mt yelloweye OY showed that exvessel revenues would be reduced by nearly 40%. However, this is likely an overestimate of what would occur if only yelloweye were to be reduced to 12 mt and other overfished species were to remain at status quo levels. In terms of recreational fisheries however, it is estimated that recreational fishing effort for groundfish and Pacific halibut off Washington would decrease by 30% under the 12 metric ton yelloweye alternative. Off Oregon, it is estimated that recreational fishing effort for groundfish and Pacific halibut would decrease by 32%, and recreational fishing effort for groundfish off California would decrease by over 33%. In addition, fishing seasons would be shortened which would have additional implications as fewer tourists would be drawn to communities during times when fishing closures are in place. This means that economic impacts will be larger than indicated by just examining changes in angler trips.

Under the 12 mt 2007 OY alternative, it is believed that commercial fixed gear vessels that homeport along the northern Washington coast and Puget Sound would experience a complete closure of traditional fishing grounds for sablefish. Some of these vessels may choose to move further south along the coast and homeport in different locations in order to access other fishing grounds, however, this would have repercussions to those communities where fixed gear vessels currently homeport, and many of these communities are described as being resource-dependent. This means those communities would be negatively impacted to a larger degree than communities that are not as dependent on resource-based industries. It is estimated that these impacts would be in place until 2078, or 30 years longer than T_{MIN}. It is important to note that state managers of recreational fisheries have stated that multiple recreational fisheries cannot operate if the 2007 OY for yelloweye is less than 12 mt. In order to achieve the necessary reductions in yelloweye mortality, managers would need to completely close multiple sectors of recreational fisheries off Washington, Oregon, and northern California, meaning that for many recreational sectors, the economic impact of T_{MIN} is equivalent to an OY that is several tons higher.

Under a 12.6 metric ton yelloweye OY in 2007 the impacts to commercial fisheries, recreational fisheries, and fishing communities is expected to be nearly equivalent to a 12 metric ton OY.

7.2.10.1.3 Economic Impact of the Ramp-Down Strategy

The yelloweye ramp-down OY results in economic impacts to recreational fisheries that range from near status quo, to reductions in angler effort of approximately 22% in 2007 compared to 2005 levels. Commercial exvessel revenues for alternatives corresponding to the yelloweye ramp-down strategy show that revenues would range from near status quo, to reductions of 13% in 2007 compared to 2005 levels. Beyond 2007, the impacts are less clear as the impact of tools that will be developed will not be fully known until after they have been implemented. However, it is expected that the economic implications will be less than the 12 mt and 12.6 mt 2007 OY alternatives. It is estimated that these impacts would be in place until 2083.5, or 35.5 years longer than $T_{F=0}$.

7.2.10.1.4 Consideration of Other Yelloweye OY Alternatives

Optimum yields that are equivalent to an SPR harvest rate of 17 metric tons or greater in 2007 exceed Tmax according to the 2006 rebuilding analysis, and therefore are not further considered. However, negative economic consequences for these alternatives are far less than SPR harvest rates that correspond to a 12 mt or 12.6 mt OY in 2007.

7.2.10.2 Economic Impacts of Zero Harvest Alternatives for Rebuilding Species

The analysis of zero harvest alternatives examined the economic impacts of setting similar overfished species OYs to zero, where similarity was determined based on the correlation of species across latitude and depths. Species that were considered similar under this definition include canary and yelloweye rockfish; bocaccio and cowcod; and Pacific ocean perch and darkblotched rockfish. Widow rockfish was analyzed independently since it tends to be caught in a more pelagic environment compared to other overfished species.

Sectors were analyzed in this case based on the known associations of those sectors with overfished species under currently in place (2006) management measures. These include existing allocations between sectors and regions, area closures that are currently in place, and current patterns of fishery effort. The analysis shows two columns indicating sectors, where one column is titled "major sector" and another column "sub-sector or area-based stratification". If a sector is not known to catch a particular overfished species at certain latitudes, then the portion or area of the sector that would need to be closed to keep the particular species catch at a zero harvest is listed specifically. For example, in order to reduce yelloweye and canary rockfish catch to zero, the fixed gear sablefish sector would need to be severely restricted, however west coast groundfish observer data shows this sector encounters those species north of Point Conception, so the affected sector is identified as "fixed gear sablefish north of Point Conception". The notion that an entire sector would need to be closed to protect an overfished species is based in the multi-species nature of the fishery. In many cases it is not possible to catch abundant stocks of target species without incidentally catching overfished species, and therefore, eliminating the catch of overfished species also requires eliminating the catch of target species that co-occur with those overfished species. In this analysis, figures represent the loss in revenue that occurs as a result of zero landings from overfished species as well as zero landings from target species that co-occur with those overfished species.

In this analysis, 2005 revenues are used as an indicator of revenue that would be lost if a sector were to be closed or restricted to reach a zero harvest of a particular overfished species. Table7-69 shows the amount of exvessel revenue that would be lost for each sector within each overfished species grouping, and the total revenue from 2005 for that entire sector is shown for comparison purposes to understand the magnitude of loss.

Based on this analysis, setting the OY of canary and yelloweye to zero would have the largest impact across recreational and commercial fisheries when compared to the other species groupings. The distribution of these impacts would be felt coastwide and across all sectors of the fishery. The second largest impact to commercial and recreational fisheries would be to set the widow OY to zero. This species would impact most sectors across the coast, but some fisheries off the Washington coast, non-groundfish trawl fisheries, and coastal pelagic species south of 40° 10 minutes North latitude would be unaffected. The species grouping with the third largest impact to commercial fisheries on an exvessel revenue basis is darkblotched and POP, whereas the species grouping with the third largest impact to recreational fisheries would be bocaccio and cowcod. Each of these groupings have very different regional and distributional impacts. Darkblotched and POP would impact most commercial sectors that are oriented toward the north, whereas bocaccio and cowcod would impact most commercial and recreational sectors that operate south of 40° 10 minutes North latitude. Finally, if the OY for all overfished species were to be set to zero, all sectors listed in the analysis would be impacted, and the total economic impact would be greater than any of the individual species groupings.

7.2.11 Other Analyses

Vulnerable Commercial Communities

Table 7-70 shows the percentage change in estimated commercial fishery income impacts by port group compared to the No Action Alternative for shoreside landings.

Under Alternative 1, the port groups with the greatest percentage decrease in estimated income from all Council managed commercial fisheries compared to the No Action alternative are Eureka (21.6%), Newport (20.2%) and Fort Bragg (20.0%). All three port groups consist of counties that were identified as three of the six "most vulnerable" counties (Lincoln, Humboldt, and Mendocino counties) in the Engagement, Dependence, Resiliency and Identification of Vulnerable Areas Analysis (Identification of Vulnerable Areas Analysis). These "most vulnerable" areas were identified for the purpose of ranking those counties and ports most reliant upon the commercial and recreational fishery resource but least able to adjust to additional decreases in harvest levels. The analysis identified six commercially "most vulnerable" counties and four "most vulnerable" cities based on commercial fishing data and one recreationally "most vulnerable" city based on recreational data. The analysis also identified several other vulnerable counties and cities that are considered potentially at risk but to a lesser degree than the "most vulnerable" areas.

Morro Bay (13%), Puget Sound (13%) and South and Central Washington Coast (10%) also have large decreases estimated under Alternative 1. The South and Central Washington Coast port group is comprised of three counties, two of which were identified as two of the six most vulnerable counties (Grays Harbor and Pacific counties). The port group also contains one of four cities identified as most vulnerable areas in the Identification of Vulnerable Areas Analysis (Ilwaco). Morro Bay and Puget Sound port groups also encompass some vulnerable areas, but to a lesser degree than the other port groups named above.

The greatest percentage decrease in estimated income from commercial groundfish fisheries compared to the No Action Alternative are Newport (43.5%), Astoria-Tillamook (41%), South and Central Washington Coast (39.9%), Coos Bay (35.9%), Eureka (35.5%), and Fort Bragg (33.3%). As mentioned above, Newport, South and Central Washington Coast, Eureka, and Fort Bragg port groups consist of five of the six counties identified as most vulnerable counties in the Identification of Vulnerable Areas Analysis (Lincoln, Grays Harbor, Pacific, Humboldt, and Mendocino counties). The Coos Bay port group also consists of one of the six counties identified as most vulnerable counties (Coos County). Astoria-Tillamook and Coos Bay encompass counties identified as vulnerable areas to a lesser degree than the ones mentioned above. However, the Astoria-Tillamook contains one of the four ports identified as most vulnerable ports (Garibaldi).

Under Alternative 2, the port groups with the greatest percentage decrease in estimated income from all Council managed commercial fisheries and groundfish fisheries compared to the No Action alternative are Newport (9.7% and 20.8% respectively) and South and Central Washington Coast (6% and 23.6% respectively). As mentioned above, these port groups consist of counties identified as most vulnerable areas.

Under Alternative 3, the port groups with the greatest percentage decrease in estimated income from all Council managed commercial fisheries and groundfish fisheries compared to the No Action alternative are North Washington Coast (4.2%) and Puget Sound (2.6%). Unidentified areas in Washington and North Washington Coast port groups are estimated to experience the largest decreases (14.3% and 9% respectively) in income. North Washington Coast contains one of the four most vulnerable ports (Neah Bay). Neah Bay and La Push are both located in the North Washington Coast port group and both are ranked as least resilient according to the Identification of Vulnerable Areas Analysis. That is, both are ranked in the top one-third of all cities on the West Coast with regard to low resiliency indicators (population levels, percentage of population living below the poverty level, unemployment rate, and industry diversification). Both were identified in a 2004 study by PSMFC as "isolated cities" or cities not located on a major highway and fell outside of a 35-mile buffer of cities over 20,000.

Vulnerable Recreational Communities

Table 7-71 shows the percentage change in estimated recreational income impacts compared to the No Action Alternative.

Under Alternative 1, the regions with the greatest percentage decrease in estimated income from total charter boat trips compared to the No Action alternative are CA South-Central Coast (53.7%), North Central Coast: San Mateo up through Marin County (47.4%), and North-Central Coast: Sonoma and Mendocino counties (47.1%). Brookings (36.1%), North Washington Coast (32.7%), and Newport (30.6%) are also expected to experience relatively large decreases. The South–Central Coast ties with the South Coast: San Diego through LA region as the most highly recreationally engaged area in California according to the Identification of Vulnerable Areas Analysis. The South–Central Coast region encompasses Moss Landing and Santa Cruz, two cities with low resiliency according to the Identification of Vulnerable Areas Analysis and two counties (Monterey and San Luis Obispo) with low resiliency. North-Central Coast: San Mateo up through Marin County contains one city with low resiliency (Oakland). The North-Central Coast: Sonoma and Mendocino region encompasses two cities (Fort Bragg and Bodega Bay) and one county (Mendocino) with low resiliency. The Brookings region contains one recreational vulnerable area (Gold Beach). North Washington Coast contains two recreational vulnerable areas (Neah Bay and La Push) and Newport contains two recreational vulnerable areas (Depoe Bay and Newport). With regard to private boat trips, North Washington Coast (27.3%), Brookings (22.1%), and South Coast: Ventura and Santa Barbara counties (20.4%) are estimated to experience the largest decreases in income. The North Washington Coast contains two recreational vulnerable cities (Neah Bay and La Push), and Brookings contains one recreational vulnerable city (Gold Beach).

The regions predicted to experience the greatest percentage decrease in estimated income under Alternative 1 from recreational groundfish charter boat fisheries compared to the No Action Alternative are the two North Central CA Coast regions (57.6% for San Mateo up through Marin County and 57.1% for Sonoma and Mendocino Counties), South Central Coast (55%) and North Washington Coast (50%). All Oregon regions are estimated to experience decreases above 39% and South CA Coast ports are estimated to experience decreases of about 35%. With regard to private trips, the South Coast regions (57.9% for Ventura and Santa Barbara counties and 57.5% for San Diego through Los Angeles County) are predicted to experience the greatest percentage decrease in income. All Oregon regions are estimated to experience decreases of above 37%.

Under Alternative 2, with regard to total charter boat trips, the regions with the greatest percentage decrease in estimated income compared to the No Action Alternative are South-Central Coast: San Luis Obispo County through Santa Cruz (52.5%), North-Central Coast: San Mateo up through Marin County (44.2%), North-Central Coast: Sonoma and Mendocino counties (43.5%), and North Washington Coast (27.9%). As mentioned previously, the South-Central Coast: San Luis Obispo County through Santa Cruz contains two counties and two cities with low resiliency. North-Central Coast: San Mateo up through Marin County contains one city with low resiliency. North-Central Coast: Sonoma and Mendocino counties contain two cities and one county with low resiliency. The North Washington Coast region contains two recreational vulnerable cities. With regard to total private trips, North Washington Coast (22%) and South Coast: Ventura and Santa Barbara counties (13%) are estimated to experience the largest decreases in income from recreational fishing.

The regions predicted to experience the greatest percentage decrease in estimated income under Alternative 2 from recreational groundfish charter boat fisheries compared to the No Action Alternative are the CA North Central regions (54.3% for Sonoma and Mendocino counties and 53.8% for San

Mateo up through Marin County), the CA South Central region (53.7%), and the North Washington Coast (41.7%). With regard to private recreational groundfish trips, the South Coast regions (34.9% for San Diego County through Los Angeles County and 34.2% for Ventura and Santa Barbara counties) and North Washington Coast (31.7%) are estimated to experience the largest decreases in income from recreational fishing.

Under Alternative 3, the regions with the greatest percentage decrease in estimated income from total recreational charter boat trips compared to the No Action Alternative are South-Central Coast (21%) and North Washington Coast (7.7%). With regard to private groundfish trips, South-Central Coast (22.1%) and South Coast: Ventura and Santa Barbara counties (10.2%) are estimated to experience the largest decreases in income from recreational fishing.

The regions predicted to experience the greatest percentage decrease in estimated income under Alternative 3 from recreational groundfish charter boat trips compared to the No Action Alternative are CA South-Central Coast (21.4%) and North Washington Coast (16.7%). With regard to private trips for groundfish, the South CA Coast (30.2% for San Diego County through LA County, and 28.9% for Ventura and Santa Barbara counties), South Central CA Coast (25.2%), and North Washington coast (24.4%) are estimated to experience the largest decreases in income from recreational fishing.

Cumulative Effects

The Council on Environmental Quality's regulations implementing the procedural provisions of the National Environmental Policy Act defines cumulative effects as

> The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Past actions affecting the socioeconomic environment have included catch restrictions and declining revenue for vessels participating in groundfish fisheries, increasing regulatory complexity, the requirement to carry vessel monitoring systems, the imposition of area closures to protect essential fish habitat, restrictions on fishing gear to protect essential fish habitat, a trawl vessel buyback, growth and change in the demographic and economic nature of coastal communities, and consolidation in the shore-based processing sector amongst others. Reasonably foreseeable future effects include continued restrictions on catch levels to protect overfished species, continued development of tools that reduce the bycatch of overfished species, and continued growth and change in the population of coastal communities. These concepts will be discussed in relation to the alternatives considered and adopted by the council in more detail following the June meeting of the Pacific Fishery Management Council.

Table 7-1. Total Commercial, Tribal, and Recreational Landings and Deliveries by Sector (mt).

Year	At-Sea Catcher-Processors	At Sea Mother-ships	Shoreside Whiting LE Trawl	Shoreside Non-whiting LE Trawl	Shoreside LE Line Gear	Shore-side LE Pot Gear	Shore-side Directed OA	Shore-side Incidental OA	Recreational	Shore-side Tribal	At-Sea Tribal	Total Ground-fish	Non-Tribal, Non-Whiting Shorebased
Landings and Deliveries													
1995	61,589	40,175	75,472	48,269	3,000	780	3,769	810	2,473	833	0	237,171	61,574
1996	66,170	43,826	83,699	48,745	3,825	541	3,443	1,073	2,893	903	15,313	270,432	63,414
1997	71,175	50,546	87,814	43,508	3,780	440	3,256	835	2,722	846	25,080	290,002	57,263
1998	70,690	50,371	88,852	34,477	2,301	398	2,563	631	4,979	495	24,787	280,544	50,328
1999	68,357	47,870	84,141	33,797	2,581	719	1,499	666	2,854	778	26,550	269,810	44,969
2000	68,341	47,166	86,210	29,337	2,417	708	1,203	504	2,406	788	6,402	245,481	38,981
2001	59,006	35,798	73,572	23,192	1,959	565	1,223	378	2,526	825	6,330	205,372	32,368
2002	36,580	26,624	45,706	20,271	1,793	372	1,099	406	2,270	918	22,286	158,325	28,481
2003	41,315	26,027	51,313	20,628	1,872	611	1,219	281	3,931	5,452	19,674	172,324	32,474
2004	73,582	24,155	89,986	18,925	1,935	634	1,215	150	1,956	8,698	23,767	245,003	26,773
Share of Total Landings and Deliveries													
1995	26%	17%	32%	20%	1%	0%	2%	0%	1%	0%	0%	100%	
1996	24%	16%	31%	18%	1%	0%	1%	0%	1%	0%	6%	100%	
1997	25%	17%	30%	15%	1%	0%	1%	0%	1%	0%	9%	100%	
1998	25%	18%	32%	12%	1%	0%	1%	0%	2%	0%	9%	100%	
1999	25%	18%	31%	13%	1%	0%	1%	0%	1%	0%	10%	100%	
2000	28%	19%	35%	12%	1%	0%	0%	0%	1%	0%	3%	100%	
2001	29%	17%	36%	11%	1%	0%	1%	0%	1%	0%	3%	100%	
2002	23%	17%	29%	13%	1%	0%	1%	0%	1%	1%	14%	100%	
2003	24%	15%	30%	12%	1%	0%	1%	0%	2%	3%	11%	100%	
2004	30%	10%	37%	8%	1%	0%	0%	0%	1%	4%	10%	100%	
Share of Non-Whiting, Non-Tribal Landings and Deliveries													
1995	0	0	0	78%	5%	1%	6%	1%	4%	0	0		100%
1996	0	0	0	77%	6%	1%	5%	2%	5%	0	0		100%
1997	0	0	0	76%	7%	1%	6%	1%	5%	0	0		100%
1998	0	0	0	69%	5%	1%	5%	1%	10%	0	0		100%
1999	0	0	0	75%	6%	2%	3%	1%	6%	0	0		100%
2000	0	0	0	75%	6%	2%	3%	1%	6%	0	0		100%
2001	0	0	0	72%	6%	2%	4%	1%	8%	0	0		100%
2002	0	0	0	71%	6%	1%	4%	1%	8%	0	0		100%
2003	0	0	0	64%	6%	2%	4%	1%	12%	0	0		100%
2004	0	0	0	71%	7%	2%	5%	1%	7%	0	0		100%

Adapted from tables associated with the Allocation Committee's February 2006 Meeting.

Table 7-2a. Total domestic shoreside landings and at-sea deliveries (round weight mt) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 1 of 2)

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	3,307	73,557	838	25,972	11,419	59,774	1,729	176,596	102,201	103,039	18,202	174	4	87	160
1982	3,822	67,465	1,027	32,613	18,625	61,470	1,277	61,470	1,277	61,470	12,704	162	8	61	164
1983	4,163	72,100	1,051	29,639	14,685	48,157	889	170,684	97,533	98,584	6,052	58	1	70	322
1984	4,060	78,889	2,721	27,703	14,077	40,020	1,079	168,549	86,939	89,660	4,488	29	0	259	598
1985	3,883	31,692	3,894	30,400	14,308	37,347	967	122,491	86,905	90,799	12,408	26	4	357	536
1986	1,894	81,639	3,463	26,127	13,290	37,012	661	164,086	78,984	82,447	26,330	12	13	130	748
1987	2,586	105,997	4,795	28,796	12,784	40,242	2,644	197,844	87,052	91,847	31,060	21	14	85	307
1988	2,656	135,781	6,867	27,043	10,876	40,980	3,788	227,991	85,343	92,210	32,334	23	41	55	260
1989	3,580	203,578	7,414	29,880	10,439	45,334	2,694	302,919	91,927	99,341	35,550	30	48	61	212
1990	2,932	175,685	8,115	27,701	9,179	43,265	1,813	268,690	84,890	93,005	24,553	19	101	34	153
1991	3,167	200,594	21,040	30,515	9,496	35,282	2,978	303,072	81,438	102,478	19,064	21	103	52	169
1992	1,883	148,186	56,127	24,796	9,360	37,000	3,255	280,607	76,294	132,421	35,710	35	65	27	217
1993	2,200	91,640	42,108	22,107	8,145	38,252	3,483	207,935	74,187	116,295	22,451	51	105	33	252
1994	2,834	162,923	73,611	19,284	7,661	35,361	3,638	305,312	68,778	142,389	14,981	133	66	71	179
1995	1,700	98,376	74,967	19,706	7,951	32,171	2,135	237,006	63,663	138,630	11,342	136	42	187	142
1996	1,790	123,419	85,127	20,807	8,339	30,487	2,559	272,528	63,982	149,109	13,800	178	54	264	150
1997	1,652	142,726	87,410	19,508	7,951	25,576	2,271	287,094	56,958	144,368	17,456	263	79	177	201
1998	506	142,810	88,601	16,722	4,410	22,619	2,180	277,848	46,437	135,038	4,342	257	117	197	223
1999	441	139,940	83,637	20,213	6,660	16,408	1,627	268,926	45,349	128,986	12,404	185	93	632	220
2000	145	120,411	85,843	16,315	6,296	11,702	1,498	242,210	35,956	121,799	14,653	121	81	705	223
2001	156	99,875	73,475	13,863	5,646	7,806	1,427	202,248	28,898	102,373	17,595	92	95	161	331
2002	205	84,494	45,808	13,220	3,830	5,974	2,115	155,646	25,344	71,151	25,302	99	79	215	422
2003	166	86,212	55,336	14,160	5,451	4,136	2,154	167,615	26,067	81,402	13,874	3	73	225	399
2004	114.6	120,735	96,504	13,726	5,848	3,340	2,770	243,037	25,799	122,302	8,969	1.6	100.7	27.48	450.7
2005	139.4	151,002	108,746	14,957	6,344	3,365	1,455	286,008	26,260	135,006	10,860	0.4	122.4	25.46	447.4
1981-1998 Avg	1,999	117,589	44,741	22,631	9,323	30,523	2,123	223,936	61,938	109,046	17,859	85	60	168	299
1991-2005 Avg	1,140	127,556	71,889	18,660	6,893	20,632	2,370	249,139	49,694	121,583	16,187	105	85	200	268
1998-2005 Avg	234	118,185	79,744	15,397	5,561	9,419	1,903	230,442	32,514	112,257	13,500	95	95	273	340

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2a. Total domestic shoreside landings and at-sea deliveries (round weight mt) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 2 of 2)

Year	California Halibut	Salmon	Sea Cucumber	California Sheephead	Gillnet Complex	CPS Squid	CPS Wetfish	HMS	Dungeness Crab	Other Crustaceans	Other Species	Total Non-groundfish	Total
1981	191	7,967	0	0	1,258	23,510	105,357	152,465	9,011	1,480	38,365	358,231	534,827
1982	180	8,831	63	0	1,173	16,360	79,436	115,923	7,623	1,233	46,247	290,168	476,468
1983	289	2,936	74	0	678	1,959	32,076	114,644	7,169	1,403	48,437	216,168	386,852
1984	239	2,180	24	0	829	993	38,084	85,203	6,239	1,849	37,260	178,274	346,822
1985	149	5,043	0	0	1,954	11,071	26,657	34,004	7,703	1,754	43,790	145,456	267,947
1986	197	7,384	35	0	1,801	21,290	28,817	36,916	7,402	1,567	51,113	183,755	347,841
1987	224	9,410	49	0	1,370	19,985	36,860	35,902	8,464	1,447	56,546	201,744	399,588
1988	249	12,518	72	0	1,082	37,232	37,902	36,616	16,715	1,430	59,874	236,403	464,392
1989	273	6,869	0	0	875	40,936	35,160	27,446	16,045	1,806	67,110	232,421	535,341
1990	190	4,682	67	0	775	28,447	39,198	16,088	13,529	2,223	49,672	179,731	448,422
1991	235	3,734	264	0	851	37,388	45,047	11,135	6,185	2,035	31,752	158,035	461,107
1992	272	2,049	0	0	379	13,116	39,219	13,899	15,125	1,607	26,641	148,361	428,968
1993	218	2,214	295	0	309	42,889	31,397	17,300	17,411	1,773	20,341	157,039	364,974
1994	188	1,802	298	118	208	55,489	26,669	20,349	17,682	1,221	17,421	156,875	462,186
1995	262	4,756	268	115	276	70,363	52,963	18,538	16,937	1,462	17,857	195,646	432,652
1996	306	3,306	381	115	347	80,715	49,154	29,396	24,564	1,498	18,931	223,159	495,685
1997	415	3,700	209	141	340	70,471	70,617	26,406	12,347	2,010	22,731	227,563	514,655
1998	415	1,850	349	119	255	2,931	68,576	29,640	11,748	1,720	10,671	133,410	411,294
1999	385	2,709	272	63	394	92,122	76,092	17,702	15,783	1,478	11,901	232,435	501,575
2000	218	3,707	291	79	333	117,984	103,360	14,534	13,015	1,619	13,496	284,419	526,692
2001	245	3,358	323	68	264	85,959	106,105	14,816	11,234	1,643	12,530	254,819	457,100
2002	309	4,660	426	52	353	72,958	106,754	12,908	15,505	1,465	16,639	258,146	413,791
2003	293	5,986	344	48	141	39,348	77,843	20,004	32,556	1,287	24,577	217,001	384,616
2004	457.7	5,662	261	39.6	174	40,068	103,288	15,117	27,542	631	17,218	210,457	453,494
2005	418.3	4,298	265	40.2	192	55,608	101,922	10,080	24,120	368	18,727	216,039	439,975
1981-2005 Avg	*272.72*	*4,864*	*185.2*	*39.912*	*664.44*	*43,168*	*60,742*	*37,081*	*14,466*	*1,520*	*31,194*	*211,830*	*438,291*
1991-2005 Avg	*309*	*3,586*	*283*	*67*	*321*	*58,494*	*70,600*	*18,122*	*17,450*	*1,454*	*18,762*	*204,894*	*449,918*
1998-2005 Avg	*343*	*4,029*	*316*	*64*	*263*	*63,372*	*92,993*	*16,850*	*18,938*	*1,276*	*15,720*	*225,841*	*448,567*

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2b. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of current dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 1 of 2)

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	1,662	12,264	141	14,834	5,258	22,339	757	57,254	44,850	44,991	20,160	780	38	165	411
1982	2,088	11,863	182	19,727	10,282	26,479	695	71,315	59,271	59,452	14,278	811	87	157	433
1983	2,284	12,783	186	17,735	7,691	23,775	529	64,983	52,014	52,200	9,753	370	13	141	805
1984	2,184	11,739	406	16,361	6,684	22,111	637	60,122	47,977	48,383	4,526	217	1	327	1,105
1985	2,241	4,631	571	18,633	10,564	23,223	576	60,440	55,238	55,809	9,648	245	47	483	1,226
1986	1,321	10,605	452	17,425	10,985	25,675	479	66,943	55,886	56,338	30,975	118	117	234	2,489
1987	2,151	14,662	664	22,235	13,423	31,069	1,949	86,153	70,827	71,491	46,534	203	176	209	1,250
1988	2,137	22,440	1,136	20,796	12,499	29,323	2,241	90,572	66,996	68,132	29,129	240	444	154	1,106
1989	2,768	29,256	1,071	20,521	10,796	32,137	1,570	98,119	67,792	68,863	28,615	215	503	176	863
1990	2,290	22,583	1,049	17,253	9,661	32,496	983	86,315	62,683	63,732	26,577	159	1,101	101	905
1991	2,457	23,437	2,396	21,246	14,330	28,922	1,669	94,457	68,624	71,020	23,407	222	1,189	148	1,077
1992	1,617	17,968	5,885	16,452	13,633	31,616	1,838	89,009	65,156	71,041	27,293	433	878	131	1,037
1993	1,846	7,071	2,843	14,669	10,009	32,530	1,774	70,742	60,827	63,670	16,472	610	1,545	140	972
1994	2,421	12,931	4,904	13,069	13,970	35,811	2,023	85,130	67,294	72,198	19,326	1,713	1,000	212	908
1995	1,683	10,194	7,821	15,367	23,640	39,581	1,721	100,007	81,992	89,814	18,088	1,898	670	476	676
1996	1,821	13,604	5,107	15,597	25,897	33,805	1,940	97,770	79,060	84,167	18,171	2,578	844	777	764
1997	1,740	19,195	8,162	14,323	27,878	27,883	2,044	101,224	73,867	82,029	15,224	3,721	1,235	690	891
1998	718	13,538	4,845	12,514	11,380	24,997	2,946	70,938	52,554	57,400	5,052	3,697	1,859	762	794
1999	715	11,723	6,871	13,679	17,103	20,497	2,547	73,134	54,541	61,411	12,822	2,682	1,577	1,545	962
2000	345	10,885	7,969	13,980	20,325	17,398	2,639	73,540	54,686	62,656	12,951	2,182	1,635	1,793	1,209
2001	387	10,569	5,748	12,631	17,512	12,880	1,957	61,684	45,367	51,115	10,293	1,703	1,905	532	1,474
2002	506	9,119	4,540	11,828	11,810	11,066	2,615	51,485	37,825	42,365	15,358	1,755	1,592	633	1,818
2003	412	10,454	5,525	13,141	18,442	7,675	2,632	58,281	42,302	47,827	7,668	61	1,504	676	2,303
2004	432	9,663	7,724	12,792	16,973	6,832	3,108	57,092	39,705	47,429	7,623	2	101	27	2,636
2005	461	17,438	12,558	13,961	20,233	6,490	2,420	73,100	43,103	55,662	10,410	0	122	25	2,485
1981-2005 Avg	1,547	14,025	3,950	16,031	14,439	24,264	1,772	75,992	58,017	61,968	17,614	1,065	807	429	1,224
1991-2005 Avg	1,171	13,186	6,193	14,350	17,542	22,532	2,258	77,173	57,794	63,987	14,677	1,550	1,177	571	1,334
1998-2005 Avg	497	11,674	6,973	13,066	16,722	13,479	2,608	64,907	46,260	53,233	10,272	1,510	1,287	749	1,710

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2b. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of current dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 2 of 2)

Year	California Halibut	Salmon	Sea Cucumber	California Sheephead	Gillnet Complex	CPS Squid	CPS Wetfish	HMS	Dungeness Crab	Other Crustaceans	Other Species	Total Non-groundfish	Total
1981	567	31,772	0	0	2,082	5,080	14,183	199,799	18,259	3,401	28,852	325,547	382,801
1982	551	37,410	25	0	1,897	3,581	9,636	134,490	18,155	3,944	27,199	252,654	323,970
1983	929	9,090	26	0	1,161	838	5,460	117,933	23,427	3,827	28,978	202,751	267,735
1984	897	10,748	10	0	1,397	500	6,852	95,099	21,798	6,705	17,509	167,690	227,811
1985	592	20,869	0	0	2,669	4,065	4,880	42,061	24,628	4,180	22,910	138,503	198,943
1986	865	25,187	16	0	2,483	4,527	4,857	44,987	22,709	5,309	23,395	168,268	235,213
1987	1,067	46,073	23	0	2,282	3,960	5,508	49,233	25,735	5,178	29,109	216,541	302,694
1988	1,246	68,050	32	0	1,936	7,868	6,461	59,069	43,507	5,758	34,883	259,885	350,457
1989	1,340	26,754	0	0	1,919	6,962	6,020	39,944	39,896	6,308	40,777	200,290	298,409
1990	985	21,966	36	0	1,649	4,748	5,420	24,676	45,598	7,187	47,905	189,014	275,329
1991	1,247	14,203	187	0	1,766	6,086	7,063	17,225	21,446	6,860	51,898	154,024	248,481
1992	1,443	9,271	0	0	939	2,497	6,270	26,177	38,884	6,710	47,608	169,570	258,580
1993	1,146	8,931	353	0	904	10,194	3,824	31,130	42,735	5,966	38,135	163,057	233,797
1994	1,117	7,260	424	750	541	14,369	3,882	37,482	52,617	5,742	35,903	183,243	268,371
1995	1,566	15,443	416	701	797	22,342	5,368	27,140	63,482	7,567	38,784	205,413	305,419
1996	1,738	9,337	544	694	982	21,908	5,452	45,587	74,352	8,091	39,254	231,072	328,845
1997	2,180	10,105	232	860	1,315	20,707	8,259	40,516	51,854	10,528	34,802	203,120	304,343
1998	2,107	5,712	456	693	892	1,631	6,860	40,274	46,281	8,658	11,416	137,143	208,080
1999	2,080	9,688	418	452	1,482	33,405	7,408	33,021	67,236	6,167	17,862	198,807	271,944
2000	1,349	13,943	605	593	1,280	27,076	11,935	32,941	61,658	8,197	20,248	199,595	273,136
2001	1,545	10,578	581	515	1,095	16,866	12,322	31,505	51,301	8,515	17,890	168,620	230,303
2002	1,988	13,015	792	391	1,504	18,261	11,944	22,032	57,848	8,257	15,082	172,270	223,755
2003	1,920	20,906	689	381	660	23,068	8,404	33,592	113,039	7,917	37,383	260,171	318,452
2004	3,119	30,676	541	329	635	19,779	12,874	29,439	100,327	1,726	29,454	228,899	285,991
2005	2,844	24,092	665	361	815	31,556	12,090	23,148	81,147	1,019	30,560	208,297	281,397
1981-2005 Avg	1,457	20,043	283	269	1,403	12,475	7,729	51,140	48,317	6,149	30,712	200,178	276,170
1991-2005 Avg	1,826	13,544	460	448	1,040	17,983	8,264	31,414	61,614	6,795	31,085	192,220	269,393
1998-2005 Avg	2,119	16,076	593	464	1,045	21,455	10,480	30,744	72,355	6,307	22,487	196,725	261,632

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2c. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of inflation adjusted 2005 dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2005 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 1 of 2)

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	2,651	19,564	225	23,663	8,388	35,635	1,208	91,332	71,545	71,770	32,159	1,244	61	263	656
1982	3,353	19,048	292	31,674	16,509	42,516	1,116	114,506	95,167	95,458	22,925	1,302	140	252	695
1983	3,613	20,219	294	28,052	12,165	37,606	837	102,787	82,273	82,567	15,427	585	21	223	1,273
1984	3,368	18,102	626	25,229	10,307	34,096	982	92,710	73,982	74,608	6,979	335	2	504	1,704
1985	3,401	7,028	867	28,277	16,032	35,243	874	91,723	83,828	84,695	14,642	372	71	733	1,861
1986	1,976	15,867	676	26,071	16,436	38,415	717	100,160	83,617	84,293	46,345	177	175	350	3,724
1987	3,172	21,621	979	32,789	19,794	45,816	2,874	127,046	104,445	105,425	68,622	299	260	308	1,843
1988	3,093	32,480	1,644	30,100	18,091	42,442	3,244	131,094	96,970	98,614	42,161	347	643	223	1,601
1989	3,939	41,634	1,524	29,203	15,364	45,734	2,234	139,631	96,474	97,998	40,722	306	716	250	1,228
1990	3,228	31,836	1,479	24,322	13,619	45,811	1,386	121,681	88,366	89,845	37,466	224	1,552	142	1,276
1991	3,467	33,068	3,381	29,977	20,219	40,808	2,355	133,274	96,825	100,206	33,026	313	1,678	209	1,520
1992	2,243	24,920	8,162	22,817	18,908	43,848	2,549	123,447	90,365	98,527	37,853	601	1,218	182	1,438
1993	2,523	9,666	3,886	20,051	13,682	44,466	2,425	96,699	83,146	87,032	22,516	834	2,112	191	1,329
1994	3,235	17,277	6,552	17,461	18,665	47,846	2,703	113,741	89,910	96,462	25,821	2,289	1,336	283	1,213
1995	2,215	13,416	10,293	20,224	31,112	52,092	2,265	131,619	107,909	118,204	23,806	2,498	882	626	890
1996	2,341	17,492	6,567	20,055	33,299	43,467	2,494	125,715	101,657	108,224	23,365	3,315	1,085	999	982
1997	2,171	23,949	10,183	17,870	34,782	34,789	2,550	126,293	92,161	102,344	18,994	4,643	1,541	861	1,112
1998	869	16,390	5,866	15,150	13,777	30,262	3,567	85,881	63,624	69,491	6,116	4,476	2,251	923	961
1999	836	13,711	8,036	15,998	20,003	23,972	2,979	85,534	63,789	71,823	14,996	3,137	1,844	1,807	1,125
2000	391	12,346	9,039	15,857	23,053	19,733	2,993	83,412	62,027	71,067	14,689	2,475	1,854	2,034	1,371
2001	436	11,908	6,476	14,232	19,731	14,512	2,205	69,501	51,116	57,593	11,597	1,919	2,146	599	1,661
2002	562	10,128	5,042	13,136	13,116	12,290	2,904	57,180	42,009	47,052	17,057	1,949	1,768	703	2,019
2003	446	11,321	5,983	14,231	19,972	8,312	2,850	63,115	45,810	51,794	8,304	66	1,629	732	2,494
2004	449	10,037	8,022	13,286	17,628	7,096	3,228	59,297	41,238	49,261	7,917	2	105	28	2,738
2005	461	17,438	12,558	13,961	20,233	6,490	2,420	73,100	43,103	55,662	10,410	0	122	25	2,485
1981-2005 Avg	2,178	18,819	4,746	21,748	18,595	33,332	2,238	101,619	78,054	82,801	24,157	1,348	1,008	538	1,568
1991-2005 Avg	1,510	16,204	7,336	17,621	21,212	28,666	2,699	95,187	71,646	78,983	18,431	1,901	1,438	680	1,556
1998-2005 Avg	556	12,910	7,628	14,481	18,439	15,334	2,893	72,127	51,590	59,218	11,386	1,753	1,465	856	1,857

NOTE: Inflation adjustment used is the U.S. GDP Deflator (http://www.bea.gov/bea/dn/home/gdp.htm). For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2c. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of inflation adjusted 2005 dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2005 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 2 of 2)

Year	California Halibut	Salmon	Sea Cucumber	California Sheephead	Gillnet Complex	CPS Squid	CPS Wetfish	HMS	Dungeness Crab	Other Crustaceans	Other Species	Total Non-groundfish	Total
1981	904	50,683	0	0	3,321	8,104	22,625	318,720	29,127	5,425	46,025	519,313	610,645
1982	885	60,067	40	0	3,046	5,750	15,472	215,942	29,150	6,333	43,672	405,670	520,177
1983	1,469	14,378	41	0	1,836	1,326	8,636	186,540	37,056	6,053	45,836	320,701	423,489
1984	1,383	16,574	15	0	2,154	771	10,566	146,646	33,613	10,339	27,000	258,585	351,294
1985	898	31,670	0	0	4,050	6,169	7,406	63,831	37,375	6,343	34,768	210,190	301,912
1986	1,294	37,685	24	0	3,715	6,773	7,267	67,310	33,977	7,943	35,004	251,763	351,926
1987	1,573	67,942	34	0	3,365	5,840	8,122	72,602	37,950	7,636	42,926	319,324	446,370
1988	1,803	98,495	46	0	2,802	11,388	9,352	85,496	62,972	8,334	50,490	376,157	507,251
1989	1,907	38,073	0	0	2,731	9,907	8,567	56,844	56,775	8,977	58,029	285,029	424,661
1990	1,389	30,966	51	0	2,325	6,693	7,641	34,786	64,281	10,132	67,533	266,458	388,139
1991	1,759	20,040	264	0	2,492	8,587	9,966	24,304	30,259	9,679	73,226	217,320	350,594
1992	2,001	12,858	0	0	1,302	3,463	8,696	36,305	53,928	9,306	66,028	235,177	358,625
1993	1,566	12,208	483	0	1,236	13,934	5,227	42,552	58,416	8,155	52,128	222,887	319,583
1994	1,492	9,700	566	1,002	723	19,198	5,187	50,079	70,301	7,672	47,969	244,827	358,565
1995	2,061	20,324	547	923	1,049	29,404	7,065	35,719	83,548	9,959	51,043	270,343	401,960
1996	2,235	12,006	699	892	1,263	28,170	7,010	58,617	95,603	10,404	50,474	297,117	422,836
1997	2,720	12,608	289	1,073	1,641	25,835	10,304	50,550	64,696	13,135	43,421	253,425	379,717
1998	2,551	6,915	552	839	1,080	1,975	8,305	48,758	56,030	10,482	13,821	166,031	251,911
1999	2,433	11,331	489	529	1,733	39,069	8,664	38,620	78,636	7,213	20,891	232,515	318,053
2000	1,530	15,815	686	673	1,452	30,711	13,537	37,363	69,935	9,297	22,966	226,388	309,801
2001	1,741	11,919	655	580	1,234	19,003	13,884	35,498	57,802	9,594	20,157	189,989	259,489
2002	2,208	14,455	880	434	1,670	20,281	13,265	24,469	64,247	9,170	16,750	191,327	248,508
2003	2,079	22,640	746	413	715	24,981	9,101	36,378	122,414	8,574	40,483	281,749	344,864
2004	3,239	31,861	562	342	660	20,543	13,371	30,576	104,201	1,793	30,591	237,738	297,035
2005	2,844	24,092	665	361	815	31,556	12,090	23,148	81,147	1,019	30,560	208,297	281,397
1981-2005 Avg	1,839	27,412	333	322	1,936	15,177	10,053	72,866	60,538	8,119	41,272	267,533	369,152
1991-2005 Avg	2,164	15,918	539	537	1,271	21,114	9,711	38,196	72,744	8,363	38,701	231,675	326,863
1998-2005 Avg	2,328	17,378	654	521	1,170	23,515	11,527	34,351	79,302	7,143	24,527	216,754	288,882

NOTE: Inflation adjustment used is the U.S. GDP Deflator (http://www.bea.gov/bea/dn/home/gdp.htm). For 1981- 1990, at- sea whiting catch estimates are from Council 1997.

Table 7-3. Overfished Species Ranking by Sector and Area.

		OVERFISHED SPECIES						
AREA	SECTOR	BCCCIO	CANARY	COWCD	D'BLTCH	POP	WIDOW	Y'EYE
N 40 10	LE FG-DOGFISH		ML					MH
	LE FG-NEARSHORE		ML					MH
	LE FG-SABLEFISH		ML					MH
	LE B-TRAWL-DEEP		ML		HIGH	HIGH		
	LE B-TRAWL-SHELF		HIGH					
	LE MW-TRAWL-WHITING		HIGH		ML	ML	HIGH	
	OA FG-DOGFISH		ML					MH
	OA FG-NEARSHORE		MH					MH
	OA FG-SABLEFISH		ML					MH
	WA REC P.HALIBUT		ML					HIGH
	WA REC BOTTOMFISH		ML					HIGH
	OR REC P. HALIBUT		MH					HIGH
	OR REC BOTTOMFISH		MH					HIGH
	CA REC BOTTOMFISH		ML					ML
38 - 40 10	LE FG-NEARSHORE	ML	ML					
	LE FG-SABLEFISH	ML	ML					
	LE B-TRAWL-DEEP	ML	ML		MH			
	LE B-TRAWL-SHELF	HIGH	MH					
	OA FG-NEARSHORE	ML	ML					
	OA FG-SABLEFISH	ML	ML					
	CA REC. BOTTOMFISH	ML	MH					ML
36 - 38	LE FG-NEARSHORE	ML	ML	ML				
	LE FG-SABLEFISH	ML	ML	ML				
	LE B-TRAWL-DEEP	ML	ML					
	LE B-TRAWL-SHELF	HIGH	ML	MH				
	OA FG-NEARSHORE	ML	ML	ML				
	OA FG-SABLEFISH	ML	ML	ML				
	CA REC. BOTTOMFISH	ML	MH					ML
S 36	LE FG-NEARSHORE	ML		ML				
	LE FG-SABLEFISH	ML		ML				
	LE B-TRAWL-DEEP	ML						
	LE B-TRAWL-SHELF	HIGH		MH				
	OA FG-NEARSHORE	ML		ML				
	OA FG-SABLEFISH	ML		ML				
	CA REC BOTTOMFISH	HIGH		ML				

Table 7-4a. Port Engagement in Groundfish Sectors in Areas North of 40°10' N Latitude.

		SECTOR								
AREA	PORT	LE B-TRAWL-DEEP	LE B-TRAWL-SHELF	LE FG-DOGFISH	LE FG-NEARSHORE	LE FG-SABLEFISH	LE MW-TRAWL-WHITING	OA FG-DOGFISH	OA FG-NEARSHORE	OA FG-SABLEFISH
N 40 10	ABERDEEN									√
	ASTORIA	√	√		√	√	√			√
	BANDON									√
	BELLINGHAM BAY	√	√	√		√		√		√
	BLAINE	√	√	√		√				
	BROOKINGS	√	√			√			√	√
	CATHLAMET					√				
	CHARLESTON (COOS BAY)	√	√			√	√		√	√
	CHINOOK					√				√
	CRESCENT CITY	√	√		√	√	√		√	√
	DEPOE BAY								√	
	EUREKA	√	√			√	√		√	√
	EVERETT					√				
	FIELDS LANDING									√
	FLORENCE									√
	GARIBALDI (TILLAMOOK)					√			√	√
	GOLD BEACH								√	
	ILWACO					√	√			√
	LAPUSH					√				√
	MILL CREEK								√	
	NEAH BAY	√	√			√				√
	NEWPORT	√	√			√	√		√	√
	PACIFIC CITY								√	
	PORT ANGELES					√				√
	PORT ORFORD				√	√			√	√
	PORT TOWNSEND									√
	SEATTLE						√			√
	TOKELAND									√
	TRINIDAD								√	
	WESTPORT	√	√			√	√			√
	WINCHESTER BAY					√				√

Table 7-4b. Port Engagement in Groundfish Fisheries in Areas South of 40°10' N Latitude.

		SECTOR								
AREA	PORT	LE B-TRAWL-DEEP	LE B-TRAWL-SHELF	LE FG-DOGFISH	LE FG-NEARSHORE	LE FG-SABLEFISH	LE MW-TRAWL-WHITING	OA FG-DOGFISH	OA FG-NEARSHORE	OA FG-SABLEFISH
38 - 40 10	ALBION								√	
	BODEGA BAY					√			√	
	FORT BRAGG	√	√			√			√	√
	POINT ARENA								√	
	POINT REYES									√
	SHELTER COVE								√	
36 - 38	BIG CREEK								√	
	BODEGA BAY									√
	ELK									√
	MONTEREY	√	√			√			√	√
	MOSS LANDING	√	√			√			√	√
	PRINCETON / HALF MOON BAY	√	√			√			√	√
	SAN FRANCISCO	√	√		√	√			√	√
	SANTA CRUZ								√	
	SANTA CRUZ									√
S 36	AVILA					√			√	
	BERKELEY								√	
	DANA POINT					√				
	LONG BEACH					√				
	MISSION BAY					√				√
	MORRO BAY	√	√			√			√	√
	NEWPORT BEACH					√				
	OCEANSIDE					√				√
	OXNARD				√	√			√	√
	PLAYA DEL REY					√				
	POINT LOMA									√
	SAN DIEGO								√	√
	SAN PEDRO								√	
	SAN SIMEON								√	
	SANTA BARBARA				√				√	
	TERMINAL ISLAND					√				√
	VENTURA								√	√
	WILMINGTON				√					

Table 7-5. Count of Vessels Making Landings by Species Group.

Species Group	2000	2001	2002	2003	2004	2005
Coastal Pelagic	487	381	355	314	313	261
Crab	1,387	1,239	1,311	1,288	1152	1,084
Groundfish	1,993	1,800	1,619	1,511	1332	1,292
Highly Migratory	958	1,116	875	1,034	919	721
Other	1,624	1,642	1,558	1,404	1328	1,234
Salmon	1,255	1,265	1,271	1,203	1427	1,339
Shellfish	110	95	228	81	123	89
Shrimp	328	301	296	215	187	170
Total Unique Vessels	4,276	4,010	4,020	3,811	3,622	3,369

Source: PacFIN FT and FTL tables. July 2005

Table 7-6. Shoreside Landings and Exvessel Revenue by Species Category and Year.

		Year				
Species Group	Data type	2001	2002	2003	2004	2005
Coastal Pelagic Species	Landed weight (lbs)	431,365,373	403,146,822	276,183,979	316,067,022	347,255,384
	Exvessel Revenue ($)	32,466,769	32,734,497	35,180,414	32,653,726	43,651,323
Crab	Landed weight (lbs)	26,646,332	37166,847	76,025,265	63,368,168	54,848,429
	Exvessel Revenue ($)	54,022,945	62,591,244	119,970,195	104,609,854	83,451,056
Groundfish	Landed weight (lbs)	226,350,318	164,017,318	180,989,727	267,801,292	296,121,120
	Exvessel Revenue ($)	52,005,278	43,443,802	49,057,826	47,832,317	56,208,733
Highly Migratory Species	Landed weight (lbs)	27,377,162	23,269,259	38,156,859	32,908,310	21,830,731
	Exvessel Revenue ($)	24,268,210	17,256,706	28,248,409	29,446,061	23,158,656
Other	Landed weight (lbs)	19,729,492	21,157,102	17,278,995	18,076,461	17,848,978
	Exvessel Revenue ($)	24,072,979	23,576,471	20,980,130	21,913,540	21,054,424
Salmon	Landed weight (lbs)	6,458,731	9,795,556	11,522,470	10,857,893	8,244,773
	Exvessel Revenue ($)	10,606,112	14,358,711	21,011,634	30,902,881	24,159,157
Shellfish	Landed weight (lbs)	18,552,635	27,117,624	28,540,501	30,588,533	31,709,371
	Exvessel Revenue ($)	44,101,283	61,294,746	65,420,466	87,913,770	79,461,336
Shrimp	Landed weight (lbs)	40,995,148	57,850,787	32,162,900	21,351,766	25,120,667
	Exvessel Revenue ($)	16,803,835	21,475,074	11,490,842	11,041,571	14,066,750
Total Landed weight (lbs)		797,475,191	743,521,315	660,860,696	761,019,445	802,979,453
Total Exvessel Revenue ($)		258,347,409	276,731,251	351,359,914	366,313,719	345,211,435

Source: PacFIN ftl table. August 2004

Note: Data shown is for PFMC management areas and does not include inside waters such as Puget Sound and Columbia River.

Table 7-7. Shoreside Landings and Revenue by Gear Type and Year.

		Year				
Gear	Data type	2001	2002	2003	2004	2005
Dredge	Landed weight (lbs)		C		C	C
	Exvessel Revenue ($)		C		C	C
Hook and Line	Landed weight (lbs)	11,020,519	12,703,981	10,772,455	10,024,355	9,156,856
	Exvessel Revenue ($)	19,231,233	17,839,558	19,844,158	19,008,966	19,500,558
Misc	Landed weight (lbs)	33,692,759	43,168,744	40,711,529	43,901,647	43,979,921
	Exvessel Revenue ($)	58,190,196	74,343,110	75,474,308	96,787,328	87,069,866
Net	Landed weight (lbs)	434,945,382	406,344,617	278,973,327	318,813,541	350,683,566
	Exvessel Revenue ($)	36,694,139	36,381,139	38,413,902	35,732,115	47,041,661
Pot	Landed weight (lbs)	29,262,535	39,985,745	79,646,584	66,968,591	59,661,693
	Exvessel Revenue ($)	64,283,421	72,130,216	131,455,587	116,678,161	97,299,820
Troll	Landed weight (lbs)	28,793,540	26,968,998	45,807,868	40,980,942	27,592,753
	Exvessel Revenue ($)	29,259,325	25,526,431	43,894,614	56,817,652	44,424,182
Trawl	Landed weight (lbs)	219,949,824	157,484,545	173,477,263	260,183,431	287,705,054
	Exvessel Revenue ($)	36,469,749	31,435,464	33,200,917	32,713,800	38,766,282
Shrimp Trawl	Landed weight (lbs)	39,810,632	56,863,283	31,471,670	20,146,932	24,197,316
	Exvessel Revenue ($)	14,219,346	19,073,996	9,076,428	8,575,689	11,107,146
Total Landed weight (lbs)		797,475,191	743,519,913*	660,860,696	761,019,439*	802,977,159*
Total Exvessel Revenue ($)		258,347,409	276,729,913*	351,359,914	366,313,709*	345,209,515*

Source: PacFIN ftl table. August 2004

Note: Data shown is for PFMC management areas only and does not include areas such as Puget Sound and Columbia River for example.

C means data was restricted due to confidentiality

* totals do not include confidential data

Table 7-8. Shoreside Groundfish Landings and Revenue by Trawl and Non-Trawl Vessels.

Gear Group	Data	2000	2001	2002	2003	2004	2005
Non-Trawl	Landed Weight (mt)	4,163	3,561	3,051	3,347	3,456	3,949
	Landed Revenue (1000's $)	16,997	14,326	12,039	14,626	14,086	16,909
Trawl	Landed Weight (mt)	117,152	98,388	70,513	73,296	109,482	116,677
	Landed Revenue (1000's $)	42,402	34,294	28,962	30,204	29,345	33,946
Trawl Portion	Landed Weight (mt)	0.97	0.97	0.96	0.96	0.97	0.97
	Landed Revenue (1000's $)	0.71	0.71	0.71	0.67	0.68	0.67

Source: PacFIN ftl data. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-9. Count of Limited Entry Trawl Vessels Making Landings by State, Year, and Vessel Length.

		Vessel Length (feet)						
State	YEAR	0–40	41 - 50	51 - 60	61 - 70	71 - 80	81 - 90	> 90
CA	2000	1	13	24	20	18	6	2
	2001	4	10	16	15	12	7	1
	2002	2	5	5	8	12	3	0
	2003	3	8	8	4	5	1	0
OR	2000	1	3	21	35	30	15	7
	2001	2	7	19	34	31	13	3
	2002	2	5	17	32	29	14	3
	2003	2	5	17	33	28	15	3
WA	2000	0	3	5	5	10	4	3
	2001	0	5	5	4	12	3	1
	2002	0	2	6	3	8	4	1
	2003	0	1	2	4	9	3	1

Source: PacFIN ftl and cg tables. July 2004

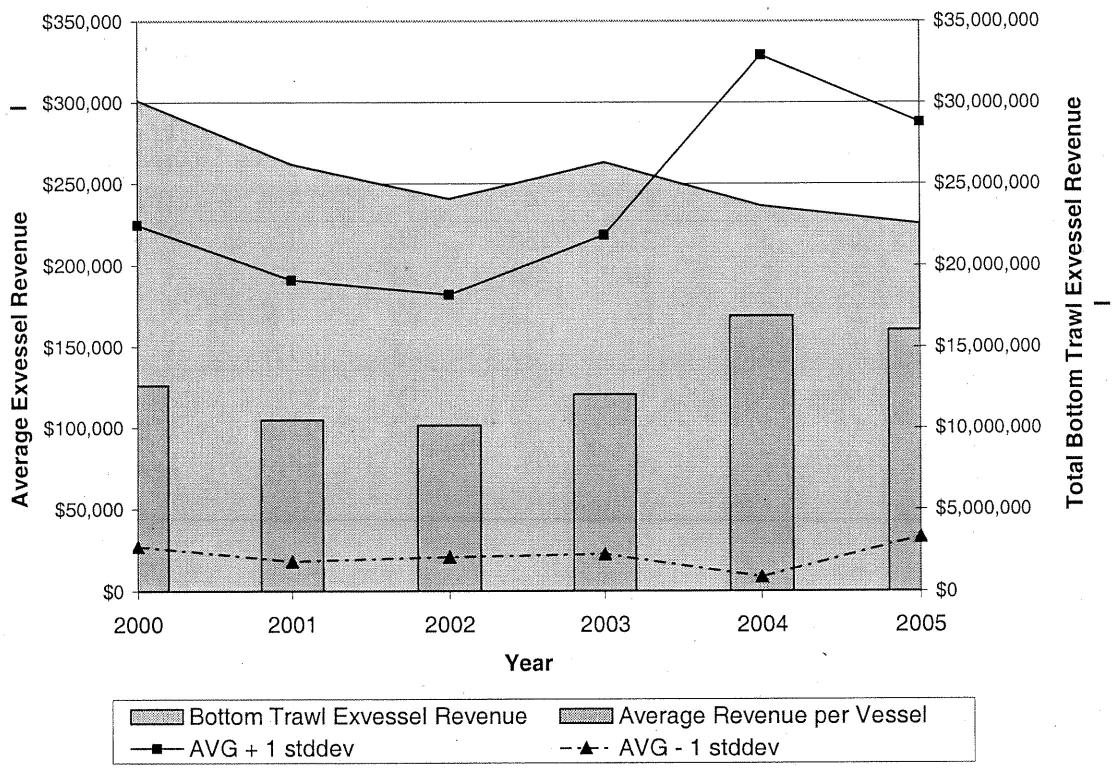


Figure 7-1. Annual Bottom Trawl Vessel Revenues per Year Where the Catch is Non-Hake Groundfish.

Table7-10. Count of Trawl Vessels Landing Non-Hake Groundfish by Port and Year.

PORT	2000	2001	2002	2003	2004
ASTORIA	54	48	41	44	32
AVILA	13	15	16	13	7
BELLINGHAM BAY	7	16	6	9	6
BROOKINGS	11	11	11	13	8
CHARLESTON (COOS BAY)	30	30	25	28	21
CRESCENT CITY	26	21	24	19	4
EUREKA	27	32	30	28	15
FIELDS LANDING	15	14			
FORT BRAGG	17	19	29	14	11
MONTEREY	5	4	5	5	3
MORRO BAY	17	10	11	10	10
MOSS LANDING	16	15	14	16	16
NEAH BAY	11	11	5	8	5
NEWPORT	41	41	31	33	27
PORT ANGELES	7	8	10		5
PRINCETON / HALF MOON BAY	14	14	12	11	12
SAN FRANCISCO	26	18	17	12	10
SANTA BARBARA	5	14	14	8	4
SANTA CRUZ	6	5	6	6	4
VENTURA	5	7	10	8	3
WESTPORT	19	11	10	9	9

Note: ports with fewer than three trawl vessels in any year were excluded for confidentiality purposes
Source: PacFIN ft and ftl tables.

Table 7-11. Non-Tribal Trawl Shoreside Landings and Exvessel Revenue by State and Year.

State	Species Aggregation	Data Type	2000	2001	2002	2003	2004	2005
CA	Non-whiting	Landed weight (mt)	9,764	7,929	8,026	7,330	6,101	5,760
		Exvessel Rev (1000's $)	11,859	9,546	10,068	8,618	7,090	7,021
	Pacific Whiting	Landed weight (mt)	4,986	2,306	2,773	1,695	4,742	3,062
		Exvessel Rev (1000's $)	765	171	274	166	641	338
OR	Non-whiting	Landed weight (mt)	15,952	12,152	8,410	10,499	10,245	10,786
		Exvessel Rev (1000's $)	17,974	14,687	10,150	12,897	11,833	12,441
	Pacific Whiting	Landed weight (mt)	68,702	53,376	32,305	36,581	59,075	61,463
		Exvessel Rev (1000's $)	6,081	4,132	3,219	3,642	4,641	7,107
WA	Non-whiting	Landed weight (mt)	5,593	4,896	8,370	4,258	3,481	3,315
		Exvessel Rev (1000's $)	4,601	4,319	4,189	3,598	3,148	3,191
	Pacific Whiting	Landed weight (mt)	12,156	17,730	10,630	12,934	25,838	32,291
		Exvessel Rev (1000's $)	1,122	1,439	1,061	1,283	1,993	3,848

Source: PacFIN ftl data. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table7-12 . Shoreside Non-Tribal Trawl Groundfish Landings and Exvessel Revenue by Year, State, and Trawl Type.

Trawl Type	State	Data	2000	2001	2002	2003	2004	2005
Bottom Trawl	CA	Landed wt (mt)	8,910	7,442	7,928	7,320	6,062	5,727
		Exvessel Rev (1000's $)	10,954	9,034	9,960	8,611	7,054	6,993
	OR	Landed wt (mt)	11,341	10,012	7,942	10,459	10,081	10,613
		Exvessel Rev (1000's $)	13,503	12,545	9,661	12,811	11,585	12,250
	WA	Landed wt (mt)	4,497	3,777	4,330	4,121	3,347	2,919
		Exvessel Rev (1000's $)	3,552	3,402	3,422	3,561	3,062	3,054
Midwater Trawl	CA	Landed wt (mt)	5,839	2,792	2,870	1,705	4,781	3,095
		Exvessel Rev (1000's $)	1,670	683	381	173	676	366
	OR	Landed wt (mt)	73,313	55,516	32,772	36,621	59,239	61,636
		Exvessel Rev (1000's $)	10,552	6,274	3,709	3,728	4,889	7,298
	WA	Landed wt (mt)	13,252	18,848	14,670	13,071	25,972	32,688
		Exvessel Rev (1000's $)	2,171	2,355	1,828	1,321	2,078	3,985
Total Landed wt (mt)			117,152	98,388	70,513	73,296	109,482	116,677
Total Exvessel Rev (1000's $)			42,402	34,294	28,962	30,204	29,345	33,946

Source: PacFIN FTL table. May 2006
Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-13. Shoreside Groundfish Landings and Revenue by Trawl and Non-Trawl Vessels.

Gear Group	Data	2000	2001	2002	2003	2004	2005
Non-Trawl	Landed Weight (mt)	4,163	3,561	3,051	3,347	3,456	3,949
	Landed Revenue (1000's $)	16,997	14,326	12,039	14,626	14,086	16,909
Trawl	Landed Weight (mt)	117,152	98,388	70,513	73,296	109,482	116,677
	Landed Revenue (1000's $)	42,402	34,294	28,962	30,204	29,345	33,946
Trawl Portion	Landed Weight (mt)	0.97	0.97	0.96	0.96	0.97	0.97
	Landed Revenue (1000's $)	0.71	0.71	0.71	0.67	0.68	0.67

Source: PacFIN ftl data. May 2006
Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-14 . Depth Based Distribution of Landed Groundfish Catch by Limited Entry Trawl Vessels Using Midwater or Bottom Trawl Gear (Pounds by Year and Depth Range).

Depth Range (fathoms)	2001	2002	2003
0-50	22,930,260	40,048,627	15,919,762
51-100	215,155,125	158,543,798	135,411,711
101-150	62,788,477	45,254,962	61,445,691
151-200	13,325,986	7,713,513	18,157,965
201-250	8,322,800	6,198,206	12,817,069
>250	20,664,041	23,096,810	30,265,559

Source: PacFIN logbook data. July 2005

Note: not all logbook records have an associated depth and depth is recorded as the average or start tow depth.

Table 7-15. Monthly Distribution of Groundfish Landed Catch by Limited Entry Trawl Vessels Using Midwater or Bottom Trawl Gear (Pounds by Month and Year).

	Year		
Month	2001	2002	2003
January	5,280,981	4,051,019	4,589,094
February	6,560,832	5,870,089	5,062,798
March	7,103,004	6,090,047	3,726,461
April	11,361,478	9,881,215	9,423,497
May	13,248,925	11,022,904	10,856,262
June	56,177,784	97,157,431	114,340,896
July	115,519,050	113,615,466	103,952,685
August	89,458,920	20,530,848	13,742,628
September	32,274,454	3,193,638	8,614,816
October	2,661,432	6,597,853	4,965,831
November	3,091,795	4,987,239	4,241,793
December	2,001,895	2,465,965	1,990,757

Source: PacFIN logbook data. July 2005

Table 7-16. Landed Weight (lbs) of Groundfish Made by Trawl Vessels by Port and Year.

PORT	2000	2001	2002	2003	2004
ASTORIA	15,733,074	12,128,458	8,265,559	9,742,986	11,691,379
AVILA	834,680	616,016	1,563,590	1,542,126	982,240
BELLINGHAM BAY	5,567,902	4,250,213	5,239,046	4,971,017	3,356,161
BROOKINGS	2,564,206	1,942,570	1,263,150	1,973,492	1,070,491
CHARLESTON (COOS BAY)	8,753,192	6,613,222	4,692,898	6,261,152	5,307,643
CRESCENT CITY	2,867,758	2,613,821	2,789,286	1,903,833	1,089,460
EUREKA	4,113,867	4,065,846	3,905,964	4,373,074	3,696,474
FIELDS LANDING	2,448,302	1,241,606			
FORT BRAGG	4,055,532	3,429,009	4,506,717	3,028,961	2,902,846
MONTEREY	862,084	692,836	573,330	547,952	409,290
MORRO BAY	285,861	195,718	167,050	248,413	777,682
MOSS LANDING	1,350,408	1,321,558	1,447,451	2,039,384	1,138,278
NEAH BAY	2,332,979	1,422,344	36,017	1,906,337	616,595
NEWPORT	7,918,289	5,823,743	4,023,203	4,997,183	4,414,402
PORT ANGELES	170,573	80,998	2,550,679		396,169
PRINCETON / HALF MOON BAY	1,537,386	1,210,273	927,221	651,677	561,930
SAN FRANCISCO	2,067,686	1,677,797	1,294,075	1,311,881	1,820,147
SANTA BARBARA	10,314	6,514	12,914	965	8,356
SANTA CRUZ	100,694	58,211	25,959	10,172	4,524
VENTURA	1,785	4,680	3,131	683	344
WESTPORT	1,803,584	1,873,952	9,075,180	1,032,300	1,006,859

Note: ports with fewer than three trawl vessels in any year were excluded for confidentiality purposes
Source: PacFIN ft and ftl tables

Table 7-17. Largest Ports for Limited Entry Trawl Vessel Groundfish Landings and Exvessel Revenue (2000–2003).

Rank	Rank by Weight	Rank by Exvessel Revenue
1	NEWPORT	ASTORIA
2	ASTORIA	NEWPORT
3	WESTPORT	CHARLESTON (COOS BAY)
4	CHARLESTON (COOS BAY)	WESTPORT
5	ILWACO	BROOKINGS
6	EUREKA	BELLINGHAM BAY
7	CRESCENT CITY	NEAH BAY
8	BROOKINGS	PRINCETON / HALF MOON BAY
9	BELLINGHAM BAY	EUREKA
10	NEAH BAY	BLAINE
11	FIELDS LANDING	CRESCENT CITY
12	PRINCETON / HALF MOON BAY	ILWACO
13	BLAINE	SAN FRANCISCO
14	SAN FRANCISCO	FIELDS LANDING
15	PORT ANGELES	GARIBALDI (TILLAMOOK)

Source: PacFIN FTL table. July 2004

Table 7-18. 1998-2005 Pacific Whiting Non-Tribal At-Seas Processing Vessels.

GROUNDFISH	WEIGHT (mt)							
	1998	1999	2000	2001	2002	2003	2004	2005
Pacific whiting	120,452	115,259	114,655	94,451	62,935	67,236	97,277	127,461
Pacific cod	0	0.04	0.19	0	0	0.25	0.02	0.01
Lingcod	0.11	0.06	0.41	0.66	0.27	0.49	1.18	2.42
Sablefish	27.83	2.1	47.13	21.5	21.02	16.95	28.71	15.13
Arrowtooth	1.04	3.21	8.61	3.76	2.17	2.86	1.12	1.26
Dover sole	0.01	0	0.27	1.53	0.65	0.85	0.14	0.38
English sole	0	0.02	0.22	0.1	0.11	0.02	0.02	0.06
Petrale sole	0	0	0	0	0	0	0	0
Rex sole	0.36	0.02	5.54	18.32	11.51	6.71	1.89	3.18
Rock sole	0	0	0	0	0	0	0	0
Starry flounder	0	0	0	0	0	0	0	0
All other flatfish spp (except hal.)	0.01	0.01	1.32	7.05	0.15	0.18	0.02	0.01
Bocaccio	1.21	0.32	2.65	0.29	0.19	0.06	0.16	0.28
Canary	2.72	1.22	1.42	1.61	2.41	0.26	4.6	1.04
Chilipepper	0.01	0.54	4.83	3.57	4.9	1.26	1.97	1.15
Darkblotched		12.07	3.13	4.31	7.38	11.02		
POP	21.28	14.15	9.61	19.74	3.62	5.16	1.05	1.64
Shortbelly	0.02	0	0.86	27.33	0.6	0.51	0.02	2.69
Thornyhead	2.51	0.02	19.07	15.21	11.91	15.65	5.64	7.09
Widow rockfish	292.76	148.95	220.62	168.91	135.6	12.25	19.8	78.65
Yellowtail	376.98	684.13	555.56	124.99	14.28	2.32	18.49	72.96
Yelloweye		0	0	0	0			
Other rockfish spp	62.36	33.15	120.34	66.15	20.54	24.74	25.83	59.22
Other groundfish	218.07	254.05	92.46	89.18	38.82	14.33	349.89	94.81
TOTAL GROUNDFISH	121,689	116,401	115,746	95,033	63,207	67,345	97,738	127,813
CPS SPECIES								
Pacific mackerel	458.78	1.47	15.52	47.29	0.04	0	0	0.03
Jack mackerel	229.14	53.84	52.98	107.43	6.85	12.38	58.07	4.44
Pacific sardine	1.94	0.18	0.06	0.23	0.01	0	0	0.04

Table 7-19. Non-Tribal Harvests and Revenues.

2005 'Metric tons of Whiting and select rockfish in non-tribal at sea

ROCKFISH SPECIES	MOTHERSHIP	CATCHER/PROCESSOR	TOTAL
Bocaccio			
POP	0.86	0.78	1.64
Thornyheads	0.74	6.34	7.09
Canary rockfish	0.7	0.34	1.04
Yellowtail rockfish	25.52	47.44	72.96
Widow rockfish	35.5	43.14	78.65
Chilipepper rockfish	0.89	0.26	1.15
Shortbelly rockfish	2.68	0.01	2.69
Darkblotched rockfish	5.08	5.95	11.02
Other rockfish	18.81	40.42	59.22
Mt whiting	48,571.23	78,889.57	127,460.80
sum	48,662.01	79,034.25	127,696.26
Mt rockfish/mt whiting	0.0019	0.0018	0.0018

2005 'Exvessel value of whiting and select rockfish in non-tribal at sea (assume hake and rockfish PPP are $0.51)

Bocaccio			
POP	97	88	184
Thornyheads	83	713	797
Canary rockfish	79	38	117
Yellowtail rockfish	2,869	5,334	8,203
Widow rockfish	3,991	4,850	8,843
Chilipepper rockfish	100	29	129
Shortbelly rockfish	301	1	302
Darkblotched rockfish	571	669	1,239
Other rockfish	2,115	4,545	6,658
whiting value	5,461,136	8,869,998	14,331,134
Sum	5,471,343	8,886,265	14,357,608

Table 7-20. Month At-Sea Harvests.

Sum of Weight (kg)				
YEAR	Calendar month	Catcher/proc.	Mothership	Tribal Mothership
2001	May	10,593,363	23,743,292	
	June	12,585,083	7,463,645	
	July	5,258,001	1,809,551	
	August	6,319,107		
	September	6,493,754		1,654,963
	October	12,431,475		4,427,861
	November	4,949,718		
2001 Total		58,630,502	33,016,488	6,082,823
2002	May	15,707,176	21,432,124	
	June		5,131,053	3,901,774
	July	3,892,390		10,354,934
	August	8,420,572		7,253,635
	September	5,520,573		
	October	2,714,559		
2002 Total		36,255,268	26,563,177	21,510,342
2003	May	9,933,710	21,606,979	
	June	4,539,275	3,748,690	6,218,430
	July	5,528,418		8,329,453
	August	7,621,855		4,719,978
	September	10,365,322		
	October	3,202,512		
2003 Total		41,191,091	25,355,669	19,267,862
2004	May	16,553,683	19,932,828	
	June	8,706,707	4,117,461	6,299,350

		July	5,922,489		10,991,465
		August	8,147,306		6,030,633
		September	17,863,890		
		October	12,336,267		
		November	3,463,771		
2004 Total			72,994,113	24,050,290	23,321,448
	2005	May	22,984,025	25,222,321	
		June	15,305,174	12,422,829	9,156,457
		July	7,991,038		10,529,339
		August	9,938,277		3,730,258
		September	14,100,781		
		October	8,554,089	5,849,297	
		November		5,063,628	
2005 Total			78,873,383	48,558,075	23,416,054

Table 7-21. Count of Limited Entry Vessels Making Landings with Hook and Line or Pot Gear by State, Year, and Vessel Length.

		Vessel Length (feet)						
State	Year	< 40	40 - 49	50 - 59	60 - 69	70–79	80 - 89	> 89
CA	2000	23	25	14	2			
	2001	13	28	9	2			
	2002	14	23	10		2		
	2003	14	18	8				
OR	2000	24	46	18	14		1	
	2001	17	31	16	13	1	1	1
	2002	15	19	14	11		1	
	2003	15	21	10	9	1	2	1
WA	2000	11	21	16	5	2	1	
	2001	6	18	13	3	2	1	
	2002	7	14	10	6	2	1	
	2003	7	16	13	5	2	1	

Source: PacFIN FTL table. July 2004

Table 7-22. Landings and Exvessel Revenue made by Limited Entry Vessels with Fixed Gear by State and Year (Hkl and Pot Gear).

			Year					
State	Species Aggregation	Data Type	2000	2001	2002	2003	2004	2005
CA	Non-Sablefish Groundfish	Landed Weight (mt)	253	247	239	276	260	290
		Exvessel $ (1000's)	1,089	974	938	1,264	1,362	1,315
	Sablefish	Landed Weight (mt)	549	436	352	390	396	393
		Exvessel $ (1000's)	1,867	1,448	1,146	1,509	1,325	1,391
OR	Non-Sablefish Groundfish	Landed Weight (mt)	74	103	51	38	33	34
		Exvessel $ (1000's)	243	367	200	117	90	77
	Sablefish	Landed Weight (mt)	984	703	435	603	849	864
		Exvessel $ (1000's)	4,875	3,426	2,279	3,339	3,430	4,085
WA	Non-Sablefish Groundfish	Landed Weight (mt)	384	260	450	228	183	293
		Exvessel $ (1000's)	240	162	221	120	109	175
	Sablefish	Landed Weight (mt)	382	346	285	481	496	612
		Exvessel $ (1000's)	2,477	2,139	1,874	3,195	2,753	3,596

Source: PacFIN FTL table. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-23. Limited Entry Vessel Groundfish Landings made with Fixed Gear by Month and Year.

	Year							
	2000		2001		2002		2003	
Mth	Landed wt (lbs)	Revenue ($)	Landed wt (lbs)	Revenue ($)	Landed wt (lbs)	Revenue ($)	Landed wt (lbs)	Revenue ($)
1	67,326	132,487	90,463	119,114	132,364	163,145	112,472	215,344
2	108,890	71,447	152,470	154,001	222,151	169,911	139,408	170,878
3	151,900	141,260	136,058	201,181	317,009	243,697	171,134	214,311
4	256,103	190,067	195,109	198,431	445,992	399,176	357,136	396,859
5	361,945	246,369	310,071	269,816	578,767	763,776	489,877	976,868
6	172,531	211,962	141,985	233,775	373,550	716,493	573,040	1,403,875
7	144,956	265,388	208,843	315,779	336,405	754,497	678,224	1,592,493
8	3,616,594	7,790,820	1,147,999	2,404,248	442,965	968,219	546,730	1,313,028
9	387,210	778,563	1,322,139	2,734,656	576,482	1,246,036	817,926	1,965,899
10	205,454	374,881	764,189	1,622,828	387,172	883,103	405,198	942,079
11	180,519	335,921	94,793	162,831	118,599	222,777	111,521	249,621
12	137,895	252,048	54,052	98,561	62,708	127,611	44,003	102,500

Source: PacFIN VSMRFD files. July 2004

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-24. Largest Ports for Limited Entry Fixed Gear Landings and Exvessel Revenue (2000-2003).

Rank	Top Ports for Exvessel Revenue	Top Ports for Landings
1	NEWPORT	BELLINGHAM BAY
2	BELLINGHAM BAY	NEWPORT
3	ASTORIA	MOSS LANDING
4	CHARLESTON (COOS BAY)	ASTORIA
5	MOSS LANDING	PORT ORFORD
6	WESTPORT	CHARLESTON (COOS BAY)
7	PORT ORFORD	WESTPORT
8	PORT ANGELES	PORT ANGELES
9	EUREKA	EUREKA
10	CRESCENT CITY	CRESCENT CITY
11	OCEANSIDE	SAN FRANCISCO
12	FORT BRAGG	FORT BRAGG
13	SAN FRANCISCO	OCEANSIDE
14	FLORENCE	FLORENCE
15	SEATTLE	NEWPORT BEACH

Source: PacFIN FTL table. July 2004

Table 7-25. Number of open access vessels by level of dependency and vessel length (based on data from November 2000 - October 2001).

	<40'	40'-50'	50'-60'	60'-70'	70'-150'	Unspecified	Total
<5%	324	109	29	28	25	1	516
>5% &<35%	154	32	6	4	1	0	197
>35% &<65%	96	8	1	0	0	0	105
>65% &<95%	115	5	0	0	1	3	124
>95% &<100%	310	21	5	2	0	7	345

Extracted from table 6-18a DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery
a/ open access vessels with more than half of their total landings value coming from groundfish are considered to be in the directed fishery

Table 7-26. Open access groundfish landings by gear group, 2000-2003 (based on 8/24/04 PacFIN data).

Open Access Gear Group	Number of Vessels Landing Groundfish	Landed Groundfish Weight (mt)	Exvessel Revenue Groundfish ($)	Exvessel Revenue per Vessel ($)
Longline - all groundfish a\				
2000	399	435	1,847,800	4,627
2001	392	408	1,656,395	4,221
2002	287	349	1,268,537	4,422
2003	307	507	1,728,038	5,625
Average	346	425	1,625,193	4,724
Longline - groundfish directed b\				
2000	133	399	1,679,851	12,619
2001	115	367	1,466,101	12,765
2002	96	318	1,129,437	11,733
2003	113	469	1,541,727	13,610
Average	114	388	1,454,279	12,682
Longline - CA Halibut				
2000	4	3	24,226	6,057
2001	2	3	29,774	14,887
2,002	2	1	5,352	2,676
2,003	0	0	0	0
Average	2	2	19,784	7,873
Pot - groundfish directed c\				
2,000	28	164	834,087	29,789
2,001	34	145	720,680	21,196
2,002	35	124	573,289	16,380
2,003	41	194	763,732	18,628
Average	35	157	722,947	21,498
Pot - Dungeness crab				

2000	71	45	165,638	2,333
2001	63	29	124,674	1,979
2002	63	34	149,311	2,370
2003	61	39	173,518	2,845
Average	65	37	153,285	2,382
Pot - prawn/shrimp				
2000	12	1	3,973	331
2001	10	5	21,569	2,157
2002	8	1	9,869	1,234
2003	7	6	25,635	3,662
Average	9	3	15,262	1,846
Pot - sheephead				
2000	49	4	43,446	887
2001	40	3	30,770	769
2002	36	9	58,951	1,638
2003	22	1	14,542	661
Average	37	5	36,927	989
Trawl - sea cucumber				
2,000	3	0.1	189	63
2,001	10	0.8	1,649	165
2,002	8	0.8	2,962	370
2,003	6	0.3	650	108
Average	7	1	1,363	177
Trawl - CA halibut				
2,000	24	22	38,697	1,612
2,001	30	7	12,324	411
2002	21	6	12,961	617
2003	15	2	5,513	368
Average	23	9	17,374	752
Trawl -Ridgeback Prawn				
2000	28	11	28,468	1,017

2001	0	0	0	0
2002	0	0	0	0
2003	0	0	0	0
Average	--	--	--	--
Line gear - all groundfish a/				
2000	1,180	391	2,029,516	1,720
2001	1,175	418	2,136,846	1,818
2002	881	406	2,178,544	2,474
2003	641	326	1,614,643	2,521
Average	969	385	1,989,887	2,133
Line gear - CA halibut				
2,000	< 285	10	32,419	114
2,001	< 270	7	31,471	117
2002	< 250	5	31,333	125
2,003	< 245	6	40,284	164
Average	< 263	7	33,877	129
Line gear - Salmon troll (coastwide)				
2,000	304	17	37,806	124
2001	229	14	27,860	122
2,002	212	10	25,336	120
2003	220	9	19,604	89
Average	241	12	27,651	115
Line gear - Salmon troll (north only)				
2000	163	11	24,280	149
2001	177	11	19,014	107
2002	152	6	13,742	90
2003	154	6	11,304	73
Average	162	9	17,085	106
Net gear - CPS				
2000	3	2	738	369

2001	1	0	2	1
2002	1	0	14	14
2003	3	0	52	17
Average	2	1	213	100

a/ multiple records exist for landings with HKL gear that do not have an associated vessel id. The vessel count in this case is an estimate

b/ annual revenue of $2,500 is used as a proxy for vessels that had efforts directed at groundfish

c\ if ≥20% of revenue was from groundfish, a vessel was assumed to have target groundfish at some point during the year

Table 7-27. Open Access Groundfish Landings and Exvessel Revenue by Year, State, and Species.

			Year			
State	Species Aggregation	Data Type	2000	2001	2002	2003
CA	Flatfish and Skates	Landed Weight (lbs)	93,158	48,856	42,579	15,140
		Exvessel Revenue ($)	87,688	63,929	61,621	20,649
	Rockfish(a)	Landed Weight (lbs)	705,190	652,021	486,113	461,812
		Exvessel Revenue ($)	1,789,851	1,750,273	1,259,855	1,027,475
	Other Groundfish	Landed Weight (lbs)	300,719	253,393	185,577	169,155
		Exvessel Revenue ($)	1,070,487	775,543	533,652	506,268
	Sablefish	Landed Weight (lbs)	657,104	558,217	541,963	675,694
		Exvessel Revenue ($)	928,945	766,276	691,173	877,637
OR	Flatfish and Skates	Landed Weight (lbs)	310	22,435	1,034	1,750
		Exvessel Revenue ($)	69	12,341	159	391
	Rockfish(a)	Landed Weight (lbs)	241,363	455,647	309,452	260,633
		Exvessel Revenue ($)	292,445	428,552	478,855	329,766
	Other Groundfish	Landed Weight (lbs)	123,930	176,758	242,546	150,631
		Exvessel Revenue ($)	329,379	462,625	678,185	399,524
	Sablefish	Landed Weight (lbs)	88,627	129,954	96,044	280,209
		Exvessel Revenue ($)	166,725	247,306	188,163	528,151
WA	Flatfish and Skates	Landed Weight (lbs)	2,899	6,052	3,045	23,268
		Exvessel Revenue ($)	814	1,453	1,067	4,533
	Rockfish(a)	Landed Weight (lbs)	172,836	338,792	670,658	662,355
		Exvessel Revenue ($)	80,701	164,664	323,228	319,673
	Other Groundfish	Landed Weight (lbs)	31,187	26,426	36,572	369,093
		Exvessel Revenue ($)	15,785	15,262	20,284	172,052
	Sablefish	Landed Weight (lbs)	73,567	89,021	99,063	181,340
		Exvessel Revenue ($)	206,543	220,195	259,410	493,547
Total Landed Weight (lbs)			2,490,890	2,757,572	2,714,646	3,251,080
Total Exvessel Revenue ($)			4,969,432	4,908,419	4,495,652	4,679,666

a) The "Rockfish" aggregation includes thornyheads and scorpionfish
Source: PacFIN VSMRFD files. July 2004
Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-28. Open Access Groundfish Landings and Exvessel Revenue by State, Year, and Gear Group.

			Year					
ST	Gear Group	Data Type	2000	2001	2002	2003	2004	2005
CA	Dredge	Landings (lbs)			C		C	
		Exvessel Rev ($)			C		C	
	Hook & Line	Landings (lbs)	1,218,626	1,053,789	865,280	818,292	1,032,803	1,086,931
		Exvessel Rev ($)	2,871,120	2,521,246	1,864,774	1,644,510	2,426,583	2,553,372
	Misc.	Landings (lbs)	2,140	148	229	63	C	752
		Exvessel Rev ($)	3,151	448	1,154	65	C	414
	Net	Landings (lbs)	100,870	128,117	98,048	106,461	137,342	122,878
		Exvessel Rev ($)	85,625	106,763	88,543	97,987	121,674	82,465
	Pot	Landings (lbs)	361,750	305,553	263,532	387,890	428,590	647,384
		Exvessel Rev ($)	852,555	704,248	557,881	677,169	702,521	955,741
	Shrimp Trawl	Landings (lbs)	18,084	8,932	8,508	4,532	37,830	71,780
		Exvessel Rev ($)	18,753	10,806	11,885	7,045	51,856	74,067
	Non-Shrimp Trawl	Landings (lbs)	54,701	15,949	19,232	4,563	29,299	32,500
		Exvessel Rev ($)	45,766	12,511	20,727	5,253	46,843	53,764
OR	Hook & Line	Landings (lbs)	421,803	563,759	615,247	642,047	623,011	920,239
		Exvessel Rev ($)	749,701	995,381	1,280,502	1,160,157	1,076,475	1,668,813
	Net	Landings (lbs)	C	C	C	C		
		Exvessel Rev ($)	C	C	C	C		
	Pot	Landings (lbs)	10,449	28,488	24,453	41,978	20,547	105,306
		Exvessel Rev ($)	19,093	54,702	57,569	89,877	41,758	163,988
	Shrimp Trawl	Landings (lbs)	21,978	19,527	9,376	8,904	3,749	140
		Exvessel Rev ($)	19,824	15,193	7,291	7,785	1,277	57
	Non-Shrimp Trawl	Landings (lbs)		173,020				
		Exvessel Rev ($)		85,548				
WA	Hook & Line	Landings (lbs)	182,386	206,037	184,726	376,393	470,624	334,782
		Exvessel Rev ($)	258,062	278,436	303,130	538,521	464617	540,182
	Net	Landings (lbs)	C	C	C	C		
		Exvessel Rev ($)	C	C	C	C		
	Pot	Landings (lbs)	864	477		11,132	10,080	106,979
		Exvessel Rev ($)	1,817	1,284		28,035	15,924	169,302
	Shrimp Trawl	Landings (lbs)	23,355	17,145	20,332	25,063	125	97
		Exvessel Rev ($)	11,537	9,774	12,577	12,905	49	54
	Non-Shrimp Trawl	Landings (lbs)	73,597	236,614	604,280	823,468	22,909	121,131
		Exvessel Rev ($)	32,382	112,078	288,282	410,344	17,207	6,491
Total Landed Weight (lbs)			2,490,891	2,757,572	2,714,645	3,251,081	2,816,909	3,550,899
Total Exvessel Revenue ($)			4,969,431	4,908,420	4,495,652	4,679,666	4,950,860	3,546,036

Source: PacFIN VSMRFD and Ext_trips_pfmc files. July 2004 and May 2006

Note: C represents data restricted due to confidentiality

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table7-29. Open Access Groundfish Landings and Exvessel Revenue by Year and Month.

		Year			
Month	Data Type	2000	2001	2002	2003
Jan	Landed Weight (lbs)	93,701	112,254	181,903	110,711
	Exvessel Revenue ($)	145,656	223,168	306,917	205,300
Feb	Landed Weight (lbs)	41,385	165,665	182,796	163,689
	Exvessel Revenue ($)	65,017	302,154	414,606	340,653
Mar	Landed Weight (lbs)	73,791	143,817	252,550	160,549
	Exvessel Revenue ($)	146,782	233,427	336,792	185,578
Apr	Landed Weight (lbs)	159,222	167,204	179,382	245,277
	Exvessel Revenue ($)	288,795	289,676	302,902	254,953
May	Landed Weight (lbs)	183,220	258,256	262,229	292,340
	Exvessel Revenue ($)	375,394	548,591	533,438	579,894
Jun	Landed Weight (lbs)	254,531	261,425	312,602	270,832
	Exvessel Revenue ($)	536,131	500,489	548,528	532,533
Jul	Landed Weight (lbs)	317,609	515,377	273,616	291,337
	Exvessel Revenue ($)	577,348	757,606	476,710	573,222
Aug	Landed Weight (lbs)	293,626	360,067	303,725	344,512
	Exvessel Revenue ($)	683,134	638,477	504,046	549,447
Sep	Landed Weight (lbs)	256,663	306,550	305,507	536,720
	Exvessel Revenue ($)	548,398	538,645	357,348	627,820
Oct	Landed Weight (lbs)	250,241	191,702	184,380	392,800
	Exvessel Revenue ($)	477,569	418,312	315,544	401,556
Nov	Landed Weight (lbs)	271,041	193,812	196,511	359,501
	Exvessel Revenue ($)	522,012	302,037	292,301	344,660
Dec	Landed Weight (lbs)	295,861	81,443	79,445	82,812
	Exvessel Revenue ($)	603,194	155,837	106,519	84,050

Source: PacFIN VSMRFD files. July 2004

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-30. Top Ports for Open Access Groundfish Landings and Revenue (2000-2003).

Rank	Top 15 Ports for Landed Revenue	Top 15 Ports for Landed Weight
1	MORRO BAY	MOSS LANDING
2	PORT ORFORD	NEAH BAY
3	MOSS LANDING	FORT BRAGG
4	FORT BRAGG	PORT ORFORD
5	GOLD BEACH	PORT ANGELES
6	AVILA	MORRO BAY
7	SANTA BARBARA	GOLD BEACH
8	PORT ANGELES	WESTPORT
9	CRESCENT CITY	EUREKA
10	NEAH BAY	CRESCENT CITY
11	SAN FRANCISCO	ASTORIA
12	MONTEREY	SAN FRANCISCO
13	ASTORIA	AVILA
14	EUREKA	CHARLESTON (COOS BAY)
15	WESTPORT	BROOKINGS

Source: PacFIN VSMRFD files. July 2004

Table 7-31. Tribal Shoreside Landings and Exvessel Revenue by Species Group and Year.

		Year				
Species Group	Data Type	2000	2001	2002	2003	2004
CPS	Landed weight (lbs)				C	
	Exvessel revenue ($)				C	
Crab	Landed weight (lbs)	922,909	665,443	1,804,399	1,420,102	2,672,525
	Exvessel revenue ($)	1,957,757	1,292,271	3,240,886	2,660,939	5,704,007
Groundfish	Landed weight (lbs)	1,152,546	1,274,750	1,675,078	11,808,437	18,689,384
	Exvessel revenue ($)	2,625,809	2,589,479	2,034,776	3,639,098	4,082,579
HMS	Landed weight (lbs)		15,110	21,664	37,950	15,301
	Exvessel revenue ($)		11,876	11,645	33,456	11,162
Other	Landed weight (lbs)	281,820	418,480	480,185	485,509	537,583
	Exvessel revenue ($)	747,950	840,983	949,711	1,271,393	1,506,766
Salmon	Landed weight (lbs)	236,966	735,977	573,684	513,772	1,090,256
	Exvessel revenue ($)	282,162	631,997	444,341	512,614	1,648,124
Shellfish	Landed weight (lbs)	C			C	C
	Exvessel revenue ($)	C			C	C
Sum of weight (lbs)		2,594,241	3,109,760	4,555,010	14,265,770	23,005,049
Sum of revenue (lbs)		5,613,678	5,366,607	6,681,358	8,117,501	12,952,638

Source: PacFIN FTL table. September 2005
Note: Totals do not include confidential data.

Table 7-32. Tribal Shoreside Landings by Gear Type and Year.

		Year				
Gear Type	Data	2000	2001	2002	2003	2004
Hook and Line	Landed weight (lbs)	1,317,524	1,406,585	1,125,842	1,362,733	1,623,791
	Exvessel revenue ($)	3,264,578	3,296,352	2,470,980	3,423,539	3,942,738
Misc.	Landed weight (lbs)	C			C	C
	Exvessel revenue ($)	C			C	C
Net	Landed weight (lbs)	55,731	119,043	11,810	5,412	4,597
	Exvessel revenue ($)	66,020	84,960	8,185	4,950	4,720
Pot	Landed weight (lbs)	943,559	665,443	1,804,399	1,420,102	2,672,525
	Exvessel revenue ($)	2,022,219	1,292,271	3,240,886	2,660,939	5,704,007
Troll	Landed weight (lbs)	198,984	656,317	600,689	567,302	1,143,716
	Exvessel revenue ($)	226,440	569,236	457,477	553,069	1,696,708
Trawl	Landed weight (lbs)	78,443	262,372	1,012,270	10,910,311	17,560,420
	Exvessel revenue ($)	34,420	123,789	503,830	1,475,040	1,604,465
Total Sum of weight (lbs)		2,594,241	3,109,760	4,555,010	14,265,860	23,005,049
Total Sum of revenue ($)		5,613,678	5,366,607	6,681,358	8,117,538	12,952,638

Source: PacFIN FTL table. July 2004
Note: Totals do not include confidential data
* for crab only

Table 7-33. West Coast groundfish catch (At-sea and Shoreside) in ocean areas by tribal fleet: 1995 through 2005 (round weight lbs).

Species	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
ARROWTOOTH FLOUNDER	240	3		255	13,195	331	961	7,137	49,700	180,500	349,100
DOVER SOLE	1,764	2,441	1,268	4,509	11,594	2,030	4,619	35,417	72,500	184,200	319,600
ENGLISH SOLE		4	118	1,847	593	996	7,103	88,684	149,300	178,700	144,700
PETRALE SOLE		5	12	3,249	545	80	1,954	45,479	185,700	185,400	65,400
REX SOLE					26	151	1,358	6,632	10,900	15,100	30,200
ROCK SOLE				2,396	16		22	5,833	5,200	5,400	5,100
UNSP. FLATFISH				38	775		437	8,406	6,400	14,800	64,400
UNSPECIFIED SANDDAB							1,599	19,655	1,700	800	2,600
SAND SOLE		12	40				269	2,748	62	2,000	1,000
STARRY FLOUNDER		22	54				3	301	20	5,000	2,800
BUTTER SOLE								605			
Flatfish Total	2,004	2,487	1,492	12,294	26,744	3,588	18,325	220,897	481,482	771,900	984,900
BOCACCIO				2	38	145	449				
NOM. CANARY ROCKFISH	59	171	26	609	1,033	539	4,064	7,071	3,200	6,800	9,500
CANARY ROCKFISH				277	252	330	1,380				
NOM. DARKBLOTCHED ROCKFISH									32	300	200
DARKBLOTCHED ROCKFISH				0	36	76	226	3,273			
GREENSTRIPED ROCKFISH				1	51	16	0				
PACIFIC OCEAN PERCH				0	110	20	16				
REDBANDED ROCKFISH				1	128	492	0				
REDSTRIPE ROCKFISH				1	63	131	1,510				
ROUGHEYE ROCKFISH				1	80	76	1,529				
ROSETHORN ROCKFISH				0	0		0				
SHARPCHIN ROCKFISH				1	9	10	85				
SILVERGREY ROCKFISH				0	36	4	12				
UNSP. POP GROUP		3			104			472	200	8,500	7,500
UNSP. ROCKFISH	114,684	79,545	65,121	65,245	59,875	45,953					
WIDOW ROCKFISH				54	411	2,010	16,265				
NOM. WIDOW ROCKFISH					53	3	51	27,969	20,600	47,300	63,000
NOM. YELLOWEYE ROCKFISH									600	1,700	1,800
YELLOWEYE ROCKFISH					68	3	2	0			
NOM. YELLOWTAIL ROCKFISH	519	1,297	2,471	10,448	28,671	9,585	7,598	572,996	602,200	775,300	1,189,100
YELLOWTAIL ROCKFISH				3,263	6,498	68,463	210,006	0			
Unsp. Shelf Rockfish						3,099	20,503	23,629	6,500	9,900	20,500
Unsp. Near-Shore Rockfish						10	58	116	73	200	500
Unsp. Slope Rockfish						19,891	54,920	32,941	42,100	50,300	63,000

BLACKGILL ROCKFISH							19				
SHORTRAKER ROCKFISH							289				
Rockfish Total	115,262	81,016	67,618	79,903	97,516	150,856	318,982	668,467	675,504	900,300	1,355,100
SPINY DOGFISH		5,521			881	6,251		2,607	8,400	88,300	13,100
LINGCOD	2,873	2,732	1,648	5,247	7,051	6,817	9,429	24,854	49,200	52,500	65,800
PACIFIC COD	2,814	1,540	2,166	4,873	2,677	4,573	8,712	128,530	471,500	678,300	272,600
SABLEFISH	1,696,098	1,881,702	1,775,108	980,719	1,566,260	1,555,808	1,451,522	959,982	1,328,100	1,563,500	1,538,500
UNSPECIFIED SKATE	2,517	1,689	1,017	2,031	2,169	1,920	1,407	18,635	47,200	19,400	51,200
NOMINAL SHORTSPINE THORNYHEAD	15,697	16,010	16,892	7,606	13,251	8,987	10,945	10,499	12,700	14,200	23,800
SHORTSPINE THORNYHEAD				471	240		27				
NOMINAL LONGSPINE THORNYHEAD	1,305	538	139	28					300		400
WALLEYE POLLOCK									257,600	101,200	43,200
Other Groundfish Total	1,721,304	1,909,732	1,796,970	1,000,975	1,592,529	1,584,356	1,482,042	1,145,107	2,175,000	2,517,400	2,008,600
PACIFIC WHITING		33,069,648	54,763,337	54,033,600	56,768,061	13,781,257	13,404,001	45,867,384	51,706,688	63,157,381	75,743,442
All Groundfish Species Total	1,838,570	35,062,883	56,629,417	55,126,772	58,484,850	15,520,057	15,223,350	47,901,855	55,038,674	67,346,981	80,092,042

Table 7-34. West Coast Groundfish Catch (At-Sea and Shoreside) in Ocean Areas by Tribal Fleet: 1995 Through 2005 (Exvessel Revenue $).

Species	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Arrowtooth Flounder	24	1		26	1,319	33	111	715	5,336	17,738	36,375
Dover Sole	570	768	393	1,478	3,817	663	1,498	11,335	23,215	60,293	112,660
English Sole		1	106	613	220	309	2,726	29,289	49,788	59,394	46,979
Petrale Sole		8	8	3,249	545	84	1,692	46,509	191,963	191,978	66,263
Rex Sole					8	51	471	2,316	3,765	5,250	12,641
Rock Sole				791	5		7	2,033	1,716	1,823	1,744
Unsp. Flatfish				13	271		145	2,773	2,106	4,927	21,296
Unspecified Sanddab							372	5,110	455	263	667
Sand Sole		9	30				204	2,084	47	1,489	630
Starry Flounder		7	16				1	98		1,591	854
Butter Sole								206			
Flatfish Total	594	794	553	6,170	6,185	1,140	7,227	102,468	278,391	344,746	300,109
Bocaccio				1	13	64	207				
Nom. Canary Rockfish	20	60	12	230	372	196	1,901	3,329	1,512	3,238	4,239
Canary Rockfish				97	89	145	655				
Nom. Darkblotched									12	142	62
Darkblotched Rockfish				0	12	33	104	1,477			
Greenstriped Rockfish				0	18	7	0				
Pacific Ocean Perch				0	38	9	7	0			
Redbanded Rockfish				0	44	216	0				
Redstripe Rockfish				0	22	58	689				
Rougheye Rockfish				0	27	33	705				
Rosethorn Rockfish				0	0		0				
Sharpchin Rockfish				0	3	4	39				
Silvergrey Rockfish				0	12	2	5				
Unsp. Pop Group		1			36			212	89	3,852	3,445
Unsp. Rockfish	48,130	32,345	26,723	26,575	25,334	20,737					
Widow Rockfish				19	143	883	7,801	0			
Nom. Widow Rockfish					19	1	16	13,425	9,880	22,618	29,949
Yelloweye Rockfish					24	2	0	0			
Nom. Yelloweye Rockfish									885	1,790	1,876

Nom. Yellowtail Rockfish	189	438	864	3,542	10,256	3,429	3,379	274,509	288,611	368,860	569,781
Yellowtail Rockfish				1,142	2,275	30,124	99,901				
Unsp. Shelf Rockfish						1,758	13,068	9,794	2,623	3,907	8,323
Unsp. Near-shore Rockfish						4	25	14,434	35	103	248
Unsp. Slope Rockfish						8,238	22,558	55	18,626	22,479	27,835
Blackgill Rockfish							9				
Shortraker Rockfish							134				
Rockfish Total	48,339	32,844	27,599	31,606	38,737	65,943	151,203	317,235	322,273	426,989	645,758
Spiny Dogfish		544			177	830		405	1,138	14,994	2,120
Lingcod	1,404	1,255	731	3,007	4,169	4,065	6,075	18,176	34,555	34,335	44,537
Pacific Cod	1,086	587	818	1,924	1,096	1,987	3,792	63,961	235,122	307,518	123,505
Sablefish	3,046,910	3,003,716	3,162,376	1,280,233	2,045,434	2,544,542	2,411,517	1,512,595	2,187,655	2,476,945	2,440,889
Unspecified Skate	588	120	68	136	145	129	143	2,563	6,303	2,014	6,896
Nom. Shrtsp. Thnyhd.	12,581	15,340	14,828	7,310	10,751	7,199	8,414	8,232	10,601	11,408	15,647
Shortspine Thornyhead				425	215		20				
Nom. Longsp. Thnyhd.	1,057	515	125	25					228		258
Walleye Pollock									136,612	14,021	6,277
Other Groundfish Total	3,063,626	3,022,077	3,178,946	1,293,060	2,061,987	2,558,752	2,429,961	1,605,932	2,612,214	2,861,235	2,640,129
Pacific Whiting		1,651,982	2,735,683	2,699,229	2,838,403	551,250	536,160	2,065,122	2,585,334	1,894,721	3,787,172
All Groundfish Species Total	3,112,559	4,707,697	5,942,781	4,030,065	4,945,312	3,177,085	3,124,551	4,090,757	5,798,212	5,527,691	7,373,168

Table 7-35. Distribution of Vessels Engaged in Tribal Groundfish Fisheries.

Treaty Tribe	Number of Vessels in Groundfish Fishery			Port
	Longline (length in ft)	Trawl (length in ft)	Total	
Makah	35 (33'-62')	10 (49'-62')	41 a/	Neah Bay/West Port
Hoh	1	-	1	La Push
Quileute	7	-	7	La Push
Quinault	10	-	10	West Port
a/ Four Makah vessels participate in both longline and trawl fisheries.				

Source: NMFS. 2004. Groundfish Bycatch Final Programmatic Environmental Impact Statement

Table 7-36. Estimated number of West Coast marine anglers: 2000 - 2002 (thousands).

Year/State	Total	State Residents	Non-Residents	% Non-Residents
2000				
Washington	497	450	47	9.50%
Oregon	365	285	80	21.90%
Northern California	-	388	-	
Southern California	-	1,097	-	
Total California	1,705	1,485	220	12.90%
2001				
Washington	915	861	54	5.90%
Oregon	601	505	97	16.10%
Northern California	-	961	-	
Southern California	-	1,838	-	
Total California	3,084	2,799	285	9.20%
2002				
Washington	1,493	1,399	94	6.30%
Oregon	1,056	845	211	20.00%
Northern California	-	2,022	-	
Southern California	-	3,709	-	
Total California	6,406	5,731	675	10.50%

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

Table 7-37. Charter vessels engaged in saltwater fishing outside of Puget Sound in 2001 by port area.

State	Port Area	Charter Boats
Washington	Neah Bay	1
	La Push	0
	Westport	13
	Ilwaco	6
	Unknown	86
	TOTAL	106
Oregon	Astoria	22
	Tillamook	51
	Newport	45
	Coos Bay	13
	Brookings	15
	Unknown	86
	TOTAL	232
California	Crescent City	1
	Eureka	4
	Fort Bragg	14
	San Francisco	67
	Monterey	33
	Conception (Northern portion)	129
	San Diego	95
	Unknown	72
	TOTAL	415
	GRAND TOTAL	753

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

Table 7-38. Total estimated West Coast recreational marine angler boat trips in 2003 by mode and region (thousands of angler trips).

State/Region	Boat Mode	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Annual Total
WA	Charter	0.0	1.2	16.0	37.8	6.1	0.0	61.1
	Private	22.0	19.5	57.2	32.9	5.0	0.0	136.5
	Total	22.0	20.6	73.2	70.7	11.1	0.0	197.6
OR	Charter	0.8	4.4	27.0	34.2	7.7	0.7	74.8
	Private	31.4	31.2	123.6	108.4	19.4	1.3	315.3
	Total	32.2	35.7	150.6	142.5	27.1	2.0	390.1
N. CA	Charter	3.4	11.3	24.1	73.3	33.0	3.3	148.4
	Private	75.9	83.9	332.5	502.8	211.5	278.2	1,485.0
	Total	79.4	95.2	356.7	576.1	244.6	281.5	1,633.4
S. CA	Charter	32.7	42.0	113.0	256.2	87.3	42.4	573.6
	Private	136.9	192.8	348.2	400.8	331.3	222.5	1,632.5
	Total	169.5	234.8	461.1	657.0	418.6	264.9	2,206.1
Total All States	Charter	36.9	58.9	180.1	401.5	134.1	46.4	857.9
	Private	266.2	327.4	861.5	1,044.9	567.2	502.0	3,569.3
	Total	303.1	386.2	1,041.6	1,446.4	701.3	548.4	4,427.2

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

Table 7-39. Trends in effort for recreational ocean fisheries in thousands of angler trips.

Area	1996	1997	1998	1999	2000	2001a/	2002a/	2003b/
<u>Total Angler Trips</u>								
Washington	51	50	44	49	40	61	56	61
Oregon	54	65	57	60	87	70	62	75
North and Central CA	90	139	158	162	206	221	142	148
Southern CA	982	812	674	609	876	577	438	574
Total	1,177	1,066	933	880	1,218	927	843	858

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

a) The 2001 and 2002 estimates are not directly comparable to previous years due to differences in estimation methodology

b) Preliminary

Table 7-40. Trends in Recreational Angling, Total Trips—All Fisheries Including Groundfish (1000 trips).

		2004	2005
Washington	Private	134	112
	Charter	63	60
	Total	197	172
Oregon	Private	160	115
	Charter	58	35
	Total	218	150
California	Private	536	520
	Charter	689	354
	Total	1225	874
Total	Private	830	747
	Charter	810	449
	Total	1640	1196

Table 7-41. Estimates of Groundfish Trips (# of trips).

	Groundfish Trip Estimates	2004 Charter	2004 Private	2004 Total	2005 Charter	2005 Private	2005 Total
Washington							
	North Washington Coast	187	8147	8334	648	12702	13350
	South and Central Coast	11588	2007	13595	13114	2207	15321
	Total	11775	10154	21929	13762	14909	28671
Oregon							
	Astoria-Tillamook	4677	2508	7185	5139	6169	11308
	Newport	17936	4198	22134	22333	7157	29490
	Coos Bay	4322	3159	7481	4172	5355	9527
	Brookings	4191	11667	15858	4596	16506	21102
	Total	31126	21532	52658	36240	35187	71427
California	North Coast	4909	29898	34807	1265	57161	58426
	North Central Coast	32478	54512	86990	29066	94930	123996
	South Central Coast	41119	44765	85884	27201	65291	92492
	South Coast	112493	34457	146950	85874	46684	132558
	Total	190999	163632	354631	143406	264066	407472
Grand Total		233900	195318	429218	193408	314162	507570

Table 7-42. Count of Buyers Purchasing Fish Caught in PFMC Waters by Year, Species Type, and State (not unique records).

State	Species Group	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CALIFORNIA	Coastal Pelagic	180	166	154	188	209	149	174	127	124	108	159
	Crab	301	236	242	262	294	271	298	307	300	357	473
	Groundfish	529	436	403	444	460	440	412	386	335	310	441
	Highly Migratory	217	185	189	267	269	265	233	241	226	203	231
	Other	582	472	448	498	538	557	558	515	533	515	690
	Salmon	240	240	238	231	264	243	277	225	273	275	343
	Shellfish	94	65	61	42	4	8	6	10	2	2	5
	Shrimp	186	137	153	174	168	157	154	126	136	107	117
OREGON	Coastal Pelagic	13	15	13	15	15	15	14	15	16	16	17
	Crab	90	89	76	72	74	76	67	78	81	84	77
	Groundfish	75	74	78	80	74	72	84	75	79	82	83
	Highly Migratory	93	72	87	99	146	110	96	114	125	143	119
	Other	73	69	80	80	97	86	89	92	103	97	94
	Salmon	69	74	89	83	81	85	104	134	143	154	121
	Shellfish	39	29	13	12	14	19	19	14	46	28	29
	Shrimp	40	40	37	38	39	35	36	37	31	27	25
WASHINGTON	Coastal Pelagic	23	20	19	19	16	11	12	17	16	15	12
	Crab	125	129	123	120	144	129	125	125	158	168	156
	Groundfish	73	51	56	51	50	39	43	42	40	45	42
	Highly Migratory	33	30	30	30	57	38	37	39	55	53	45
	Other	129	105	104	102	115	103	109	102	98	106	106
	Salmon	188	190	184	178	173	161	189	218	219	213	202
	Shellfish	228	246	226	208	207	181	167	180	177	170	194
	Shrimp	60	56	60	71	77	74	75	72	72	80	72

Source: PacFIN ftl and ft tables. December 2005

Note: records are not unique buyers and should not be summed

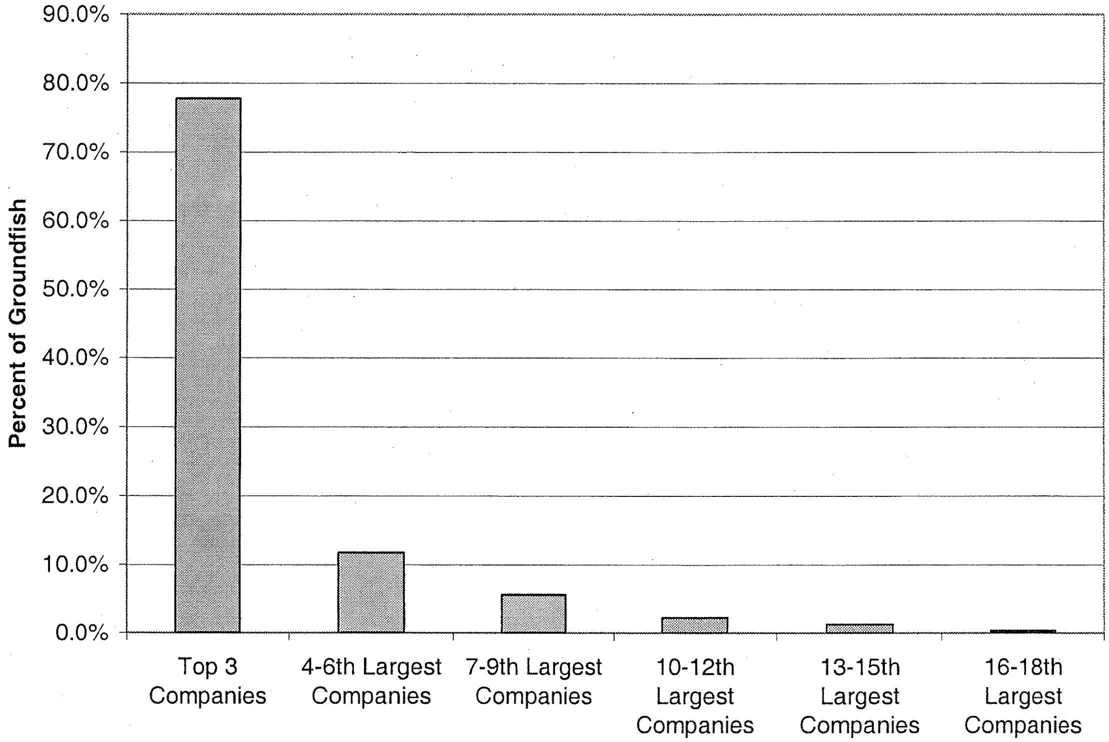
Table 7-43. Number of Dealers by Fishing Sector and State, 1986-2005.

State	Fishery	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
California																					
	Non_Whiting Groundfish Trawl	96	67	63	76	75	86	86	78	85	75	67	62	78	87	51	63	65	55	43	37
	Fixed Gear - Hook&Line and Pot	229	300	306	328	347	340	382	323	335	284	291	320	303	294	286	259	216	200	200	156
	Fixed Gear - Sablefish	34	28	33	48	40	44	66	48	40	52	51	62	43	60	60	53	56	60	48	34
	Whiting_trawl	2	4	3	5	5	3	3	3	4	3	3	4	4	3	4	4	1	2	2	2
	TOTAL (all fisheries)	**507**	**758**	**703**	**725**	**720**	**709**	**687**	**661**	**688**	**588**	**596**	**646**	**693**	**673**	**660**	**616**	**627**	**608**	**592**	**465**
Oregon																					
	Non_Whiting Groundfish Trawl	21	31	25	22	24	26	29	28	29	27	25	22	21	22	18	18	16	13	12	13
	Fixed Gear - Hook&Lne and Pot	50	51	50	62	65	63	65	54	58	50	57	56	54	47	54	47	43	36	42	45
	Fixed Gear - Sablefish	26	23	17	23	20	24	28	24	31	34	36	27	22	28	31	29	29	39	36	30
	Whiting_trawl	6	3	5	1	4	8	6	7	8	9	7	10	7	8	8	7	7	8	5	5
	TOTAL (all fisheries)	**154**	**159**	**152**	**208**	**192**	**170**	**153**	**166**	**161**	**147**	**156**	**159**	**204**	**180**	**179**	**222**	**233**	**246**	**195**	**177**
Washington																					
	Non_Whiting Groundfish Trawl	41	29	35	28	28	27	29	25	20	14	16	15	12	8	12	15	9	8	6	7
	Fixed Gear - Hook&Lne and Pot	60	67	61	58	55	46	47	48	45	32	26	27	22	17	19	13	7	7	8	10
	Fixed Gear - Sablefish	34	23	35	28	27	20	37	29	33	23	32	24	22	24	22	20	18	24	21	19
	Whiting_trawl	5	6	5	5	3	6	5	6	4	4	6	5	4	4	2	3	2	2	3	2
	TOTAL (all fisheries)	**354**	**358**	**363**	**356**	**347**	**367**	**340**	**367**	**273**	**261**	**237**	**236**	**245**	**210**	**229**	**233**	**258**	**277**	**242**	**223**

Table 7-44. Rank of Processing Companies by Volume of Groundfish Purchased on the West Coast in 2004 and 2005.

Company Rank	Percent of Groundfish Landings	Weight of Groundfish Landings (mt)
Top 3 Companies	77.8%	178,222
4-6th Largest Companies	11.7%	26,922
7-9th Largest Companies	5.6%	12,919
10-12th Largest Companies	2.2%	5,119
13-15th Largest Companies	1.3%	2,960
16-18th Largest Companies	0.4%	854

Source: PacFIN ftl and ft tables. December 2005



Source: PacFIN ftl and ft tables. December 2005

Figure 7-2. Rank of Processing Companies by Volume of Groundfish Purchased on the West Coast in 2004 and 2005.

Table 7-45. Seafood Processing Employment and Wage Information by State and Year (information from private entities).

		State			
	Year	Washington	Oregon	California	Sum
Number of employees in seafood product preparation and packaging	2001	7,043	1,093	3,030	11,166
	2002	6,359	1,002	2,530	9,891
	2003	6,391	1,020	2,738	10,149
	2004	6,432	995	2,605	10,032
Number of seafood product preparation and packaging establishments	2001	147	30	69	246
	2002	128	25	62	215
	2003	117	24	65	206
	2004	109	24	65	198
Total wages from seafood product preparation and packaging	2001	$293,322,000	$ 21,478,000	$66,624,000	$ 381,424,000
	2002	$293,013,000	$ 21,178,000	$65,529,000	$ 379,720,000
	2003	$300,751,000	$ 21,115,000	$78,654,000	$ 400,520,000
	2004	$308,261,000	$ 21,507,000	$87,722,000	$ 417,490,000
Average weekly wage from seafood product preparation and packaging	2001	$ 801	$ 378	$ 423	
	2002	$ 886	$ 406	$ 498	
	2003	$ 905	$ 398	$ 552	
	2004	$ 922	$ 416	$ 648	
Average annual wage from seafood product preparation and packaging	2001	$ 41,648	$ 19,653	$ 21,989	
	2002	$ 46,080	$ 21,127	$ 25,898	
	2003	$ 47,058	$ 20,709	$ 28,728	
	2004	$ 47,924	$ 21,617	$ 33,673	

Source: Bureau of Labor Statistics. December 2005. Quarterly Census of Employment and Wages. Personal Communication. http://www.bls.gov/data/

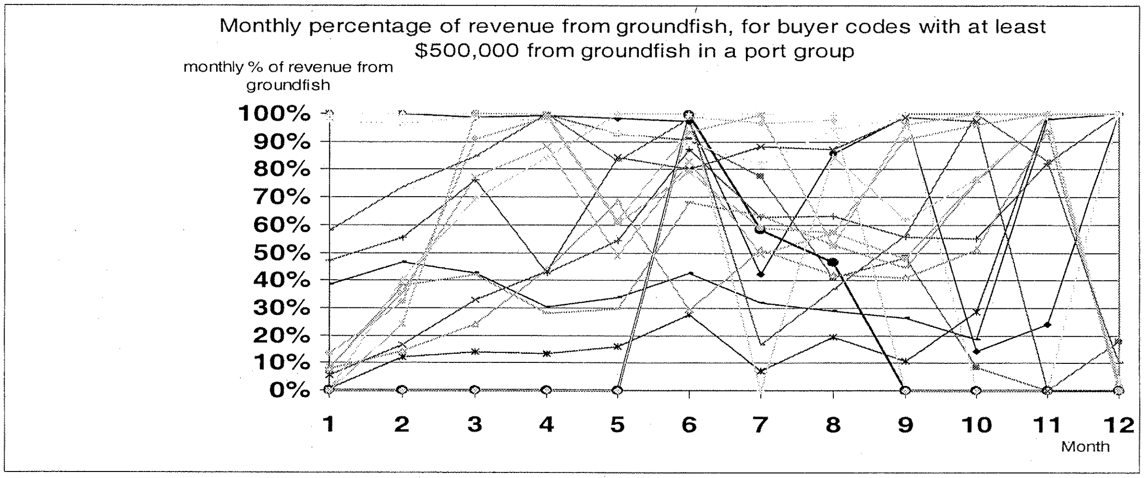


Figure 7-3. Seasonality of Groundfish Purchases by Major Buyers.

Table 7-46. Ex-vessel and Fuel Price Trends.

	Inflation Adjusted Ex-vessel, Fuel Prices, and Revenues per Bottom Trawl Hour						
	Whiting $/lb	Flatfish $/lb	Sablefish $/lb	Rockfish $/lb	Total Groundfish $/lb	Revenue/hour $/hr	Fuel $/gallon
1999	$0.04	$0.36	$1.36	$0.66	$0.64	$264.25	$0.93
2000	$0.05	$0.44	$1.66	$0.76	$0.78	$285.99	$1.17
2001	$0.04	$0.47	$1.59	$0.84	$0.80	$260.69	$1.21
2002	$0.05	$0.45	$1.55	$0.93	$0.75	$249.48	$0.97
2003	$0.05	$0.46	$1.66	$0.91	$0.80	$311.24	$1.12
2004	$0.04	$0.44	$1.37	$0.96	$0.73	$351.13	$1.70
2005	$0.05	$0.42	$1.45	$0.87	$0.74	$345.3[e/]	$2.20

	Change in Prices Relative to 1999					Bottom Trawl	
	Whiting	Flatfish	Sablefish	Rockfish	Total Groundfish	Revenue/hour	Fuel
1999	100%	100%	100%	100%	100%	100%	100%
2000	125%	122%	122%	115%	122%	108%	126%
2001	100%	131%	117%	127%	125%	99%	130%
2002	125%	125%	114%	141%	117%	94%	104%
2003	125%	128%	122%	138%	125%	118%	120%
2004	100%	122%	101%	145%	114%	133%	182%
2005	125%	117%	107%	132%	116%		236%

Ex-vessel Prices PacFIN
Fuel Prices-June Marine Fuel Prices, Newport as collected by PSMFC
Bottom Trawl Revenue/Hour Fished, NMFS NWR-Burden (12/2005)
All prices deflated to 2005
[e/]: preliminary estimate (logbook data not complete)

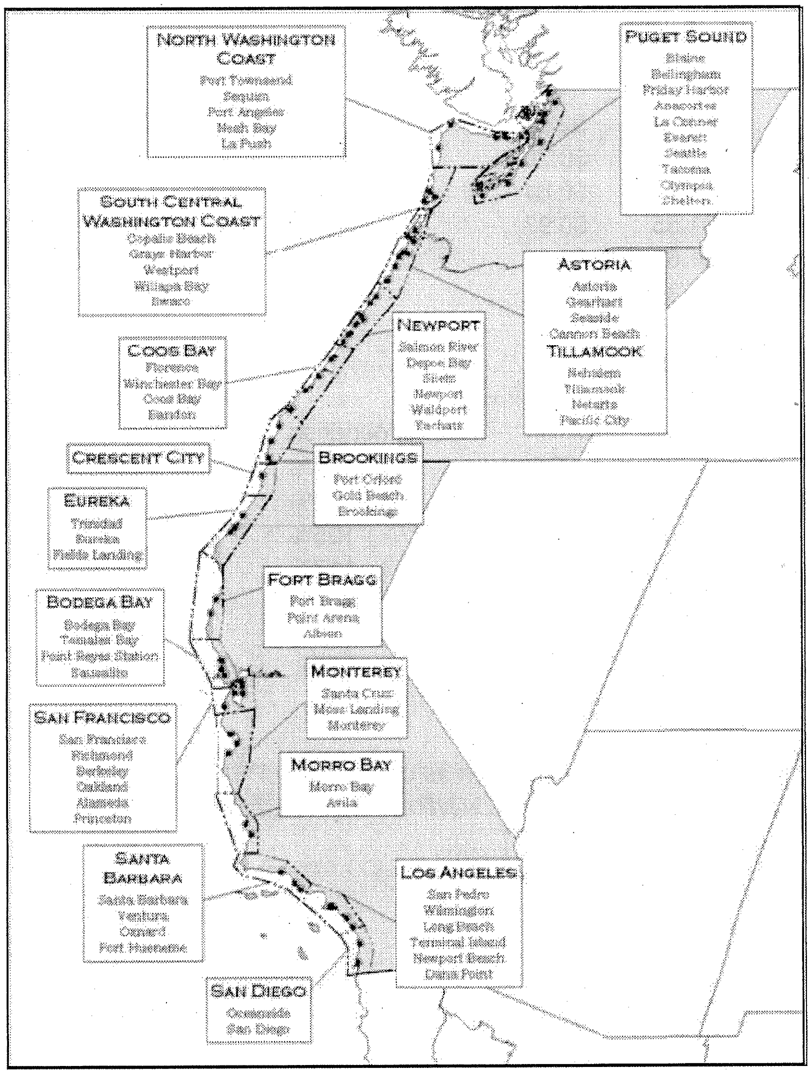


Figure 7-4. West Coast Fishing Communities.

Table 7-47. Port Group County Community Relationships.

Port Group Area	County	Name	Port Group Area	County	Name
Washington			**California**		
Puget Sound	Whatcom	Blaine	Crescent City	Del Norte	Crescent City
	Whatcom	Bellingham Bay		Del Norte	Other Del Norte County Ports
	San Juan	Friday Harbor	Eureka	Humboldt	Eureka (Includes Fields Landing)
	Skagit	Anacortes		Humboldt	Fields Landing
	Skagit	La Conner		Humboldt	Trinidad
	Snohomish	Other North Puget Sound Ports		Humboldt	Other Humboldt County Ports
	Snohomish	Everett	Fort Bragg	Mendocino	Fort Bragg
	King	Seattle		Mendocino	Albion
	Pierce	Tacoma		Mendocino	Arena
	Thurston	Olympia		Mendocino	Other Mendocino County Ports
	Mason	Shelton	Bodega Bay	Sonoma	Bodega Bay
	Unknown	Other South Puget Sound Ports		Marin	Tomales Bay
North Washington Coast	Jefferson	Port Townsend		Marin	Point Reyes
	Clallam	Sequim		Marin	Other Son. and Mar. Co. Outer Coast Ports
	Clallam	Port Angeles		Marin	Sausalito
	Clallam	Neah Bay	San Francisco	Alameda	Oakland
	Clallam	La Push		Alameda	Alameda
South & Central WA Coast	Grays Harbor	Copalis Beach		Alameda	Berkely
	Grays Harbor	Grays Harbor		Contra Costa	Richmond
	Grays Harbor	Westport		San Francisco	San Francisco
	Pacific	Willapa Bay		San Mateo	Princeton
	Pacific	Ilwaco/Chinook		San Francisco	San Francisco Area
	Klickitat	Other Columbia River Ports		San Francisco	Other S.F. Bay and S.M. Co. Ports
Unidentified WA	Pacific	Other Washington Coastal Ports			
	Unknown	Unknown WA Ports			

Port Group Area	County	Name
Oregon		
Astoria	Multnomah	Pseudo Port Code for Columbia R.
	Clatsop	Astoria
	Clatsop	Gearhart - Seaside
	Clatsop	Cannon Beach
	Unknown	Landed in WA; Transp. to OR
Tillamook	Tillamook	Nehalem Bay
	Tillamook	Tillamook / Garibaldi
	Tillamook	Netarts Bay
	Tillamook	Pacific City
Newport	Lincoln	Salmon River
	Lincoln	Siletz Bay
	Lincoln	Depoe Bay
	Lincoln	Newport
	Lincoln	Waldport
	Lincoln	Yachats
Coos Bay	Lane	Florence
	Douglas	Winchester Bay
	Coos	Coos Bay
	Coos	Bandon
Brookings	Curry	Port Orford
	Curry	Gold Beach
	Curry	Brookings

California Recreational Groupings

North Coast: Humboldt and Del Norte Counties

North-Central: Sonoma,Mendocino , San Mateo to Marin

South-Central Coast: San Luis Obispo through Santa Cruz

South Coast: Ventura to San Diego Counties

Port Group Area	County	Name
California		
Monterey	Santa Cruz	Santa Cruz
	Monterey	Moss Landing
	Monterey	Monterey
	Monterey	Other S.C. and Mon. Co. Ports
Morro Bay	San Luis Obispo	Morro Bay
	San Luis Obispo	Avila
	San Luis Obispo	Other S.L..O. Co. Ports
Santa Barbara	Santa Barbara	Santa Barbara
	Santa Barbara	Santa Barbara Area
	Ventura	Port Hueneme
	Ventura	Oxnard
	Ventura	Ventura
	Ventura	Other S.B. and Ven. Co. Ports
Los Angeles	Los Angeles	Terminal Island
	Los Angeles	San Pedro Area
	Los Angeles	San Pedro
	Los Angeles	Willmington
	Los Angeles	Longbeach
	Orange	Newport Beach
	Orange	Dana Point
	Orange	Other LA and Orange Co. Ports
San Diego	San Diego	San Diego
	San Diego	Oceanside
	San Diego	San Diego Area
	San Diego	Other S.D. Co. Ports
Unidentified CA	Unknown	Unknown CA Ports

Table 7-48. Environmental Justice—Communities of Concern.

Name	Qualifying Demographic Criteria
Blaine, Washington	poverty rate
La Conner, Washington	% Hispanic
Neah Bay, Washington	% nonwhite, % Native American, average income, poverty rate
La Push, Washington	% nonwhite, % Native American, poverty rate
Copalis Beach, Washington	income
Westport, Washington	income, poverty rate
Willapa Bay	income, poverty rate
Salmon River, Oregon	% Native American
Siletz Bay, Oregon	% Native American
Waldport, Oregon	income
Winchester Bay, Oregon	income, poverty rate
Port Orford, Oregon	income, poverty rate
Brookings, Oregon	% Native American, income
Trinidad, California	% Native American, income, poverty rate
Fort Bragg, California	% Hispanic
Albion, California	% Hispanic
Point Arena, California	% Native American, % Hispanic
Moss Landing, California	% Native American, % Hispanic

Table 7-49. Optimum Yields for Rebuilding Species and Representative Target Species by Alternative.

	2005 & 2006 OY		OY by Preliminary Preferred Alternative			Change from2006 OY			%change from 2006 OY		
SPECIES	2005	2006	Action I	Action 2	Action 3	Action I	Action 2	Action 3	Action I	Action 2	Action 3
OVERFISHED SPECIES											
PACIFIC OCEAN PERCH	447	447	44	100	100	-403	-347	-347	-90%	-78%	-78%
WIDOW ROCKFISH	285	289	120	368	368	-169	79	79	-58%	27%	27%
CANARY ROCKFISH	47	47	32	44	44	-15	-3	-3	-32%	-6%	-6%
BOCACCIO	307	309	40	218	218	-269	-91	-91	-87%	-29%	-29%
COWCOD	4.2	4.2	4	8	8	-0.2	3.8	3.8	-5%	90%	90%
DARK-BLOTCHED	269	200	130	229	229	-70	29	29	-35%	15%	15%
YELLOWEYE	26	27	12.6	23	23	-14.4	-4	-4	-53%	-15%	-15%
TARGET SPECIES											
PACIFIC WHITING (US)	269,069	269,069	150,000	220,000	260,000	-119,069	-49,069	-9,069	-44%	-18%	-3%
LINGCOD - coastwide	2,414	2,414	6,280	6,280	6,280	3,866	3,866	3,866	160%	160%	160%
SABLEFISH (coastwide)	7,761	7,634	5,934	5,934	5,934	-1,700	-1,700	-1,700	-22%	-22%	-22%
YELLOWTAIL ROCKFISH	3,896	3,681	4,548	4,548	4,548	867	867	867	24%	24%	24%
SHORTSPINE THD	999	1,018	2,055	2,055	2,055	1,037	1,037	1,037	102%	102%	102%
NEARSHORE SPECIES	122	122	142	142	142	20	20	20	16%	16%	16%
DOVER SOLE	7,476	7,564	16,500	16,500	16,500	8,936	8,936	8,936	118%	118%	118%
ENGLISH SOLE	3,100	3,100	6,237	6,237	6,237	3,137	3,137	3,137	101%	101%	101%
PETRALE SOLE (coastwide)	2,762	2,762	2,499	2,499	2,499	-263	-263	-263	-10%	-10%	-10%
STARRY FLOUNDER	1,221	1,395	890	890	890	-505	-505	-505	-36%	-36%	-36%

Table 7-50. Coastwide Exvessel Revenue by Directed Non-Tribal Groundfish Sector and Alternative (thousands of USD).

Sector	2005 Rev	Action 1	Action 2	Action 3	Reb Alt 1	Reb Alt 2	Reb Alt 3	Reb Alt 4	Reb Alt 5
Nearshore Groundfish	2,847	2,257	2,791	2,847	2,295	2,791	2,847	2,295	2,295
LE Bottom Trawl	21,969	12,982	22,868	23,145	24,165	23,491	27,660	25,288	13,758
LE Whiting	29,562	17,293	23,135	30,146	17,293	30,146	30,146	17,293	17,293
FG Sablefish N CP	14,387	8,723	8,723	8,723	8,723	8,723	8,723	8,723	8,723
FG South 34 27	2,137	1,517	2,137	2,137	2,137	2,137	2,137	2,137	1,517
Total	68,765	42,772	59,654	64,861	52,476	65,151	69,376	53,599	42,069
% of Status Quo	100%	62%	87%	94%	76%	95%	101%	78%	61%

Table7-51 Coastwide Recreational Effort Estimates by Target and Alternative

		Action Alternatives			Rebuilding Alternatives				
Target	2005	Action 1	Action 2	Action 3	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Grdfish	507,570	325,127	395,025	556,893	418,408	504,200	519,956	414,950	322,675
Halibut	31,359	25,563	26,246	30,980	32,254	30,980	32,254	26,246	25,563
Total Bottom fish	538,929	350,690	421,271	587,873	450,662	535,180	552,210	441,196	348,238
Grdfish	% of 2005	64%	78%	110%	82%	99%	102%	82%	64%
Halibut		82%	84%	99%	103%	99%	103%	84%	82%
Total Bottom fish	% of 2005	65%	78%	109%	84%	99%	102%	82%	65%

Table 7-52 LE Bottom Trawl Exvessel Revenue by Region and Period under Action Alternative 1

	Two Month Period						
Region	1	2	3	4	5	6	Total
N WA	186,926	141,610	280,051	371,155	165,609	173,610	1,318,961
S WA / N OR	923,242	719,192	847,808	840,507	764,800	763,553	4,859,101
S OR / N CA	716,436	439,000	559,494	668,514	648,570	796,771	3,828,784
OTHER CAL	285,045	335,361	577,726	640,449	522,079	534,977	2,895,636
UNKN	11,383	16,251	19,195	11,748	13,553	7,362	79,490
Total	2,123,031	1,651,413	2,284,274	2,532,372	2,114,611	2,276,272	12,981,972

Table 7-53 LE Whiting Trawl Exvessel Revenue by Region and Period under Action Alternative 1

		Two Month Period						
Sector	Region	1	2	3	4	5	6	Total
At-Sea	N WA			2,627,167	5,652,569	55,976		8,335,712
Shore-based	N WA	-	-	3,154	9,942	3,147	-	16,243
	S WA / N OR	-	79,368	1,501,769	3,271,655	27,652	-	4,880,443
	S OR / N CA	1,375	54,112	289,329	578,886	7,431	-	931,133
	C AND S CAL	-	-	-	-	-	-	-
	OTHER	-	-	-	-	-	-	-
	Total	1,375	133,481	4,421,418	9,513,051	94,206	-	14,163,532

Table 7-54 Nearshore Groundfish Exvessel Revenue by Region under Action Alternative 1

Region	2005 Revenue	Exvessel Revenue
North of 40 10 latitude	1,379,012	797,058
South of 40 10 latitude	1,327,490	1,460,764
Total	2,706,502	2,257,822

Table 7-55 LE Bottom Trawl Exvessel Revenue by Region and Period under Action Alternative 2

	Two Month Period						
REGION	1	2	3	4	5	6	Total
N WA	312,015	258,993	411,390	557,333	271,916	248,962	2,060,608
S WA / N OR	1,543,505	1,362,544	1,613,443	1,510,891	1,373,308	1,130,079	8,533,769
S OR / N CA	1,137,883	947,487	1,191,618	1,357,948	1,322,423	1,116,958	7,074,318
OTHER CAL	400,163	540,126	1,122,040	1,253,585	992,839	735,142	5,043,895
UNKN	18,007	24,488	53,113	27,074	21,469	10,875	155,026
Total	3,411,571	3,133,638	4,391,603	4,706,831	3,981,956	3,242,017	22,867,616

Table 7-58 LE Whiting Trawl Exvessel Revenue by Region and Period under Action Alternative 2

		Two Month Period						
Sector	Region	1	2	3	4	5	6	Total
At Sea	N WA			3,614,319	11,457,946	65,099		11,554,788
Shore-based	N WA	-	-	4,377	13,798	4,367	-	22,542
	N OR	-	110,146	2,084,141	4,540,372	38,375	-	6,773,034
	S OR N CAL	1,909	75,097	401,528	803,372	10,312	-	1,292,217
	OTHER CAL	-	-	-	-	-	-	-
	UNKN	-	-	-	-	-	-	-
	Total	1,909	185,243	6,104,365	16,815,488	118,154	-	19,642,582

Table 7-59 Nearshore Groundfish Exvessel Revenue by Region under Action Alternative 2

Region	2005 Revenue	Exvessel Revenue
North of 40 10	1,379,012	1,072,911
South of 40 10	1,327,490	1,718,545
Total	2,706,502	2,791,457

Table 7-60 LE Bottom Trawl Exvessel Revenue by Region and Period under Action Alternative 3

	Two Month Period						
Region	1	2	3	4	5	6	Total
N WA	312,015	260,130	433,394	583,330	271,916	248,962	2,109,747
S WA / N OR	1,543,505	1,362,544	1,698,945	1,571,126	1,373,419	1,130,079	8,679,618
S OR / N CA	1,137,883	947,487	1,231,536	1,392,844	1,322,423	1,116,958	7,149,132
OTHER CA	400,163	540,126	1,122,110	1,253,694	992,839	735,142	5,044,074
UNKN	18,007	24,488	56,072	31,563	21,469	10,875	162,474
Total	3,411,571	3,134,775	4,542,057	4,832,557	3,982,067	3,242,017	23,145,044

Table 7-61 LE Whiting Trawl Exvessel Revenue by Region and Period under Action Alternative 3

Sector	Region	1	2	3	4	5	6	Total
At Sea	N WA			2,934,442	11,479,234	2,452,763		15,112,714
Shore-based	N WA	-	-	6,752	21,283	6,737	-	34,771
	S WA / N OR	-	169,903	3,214,833	7,003,624	59,194	-	10,447,554
	S OR / N CA	2,944	115,838	619,366	1,239,219	15,907	-	1,993,274
	OTHER CA	-	-	-	-	-	-	-
	UNKN	-	-	-	-	-	-	-
	Total	2,944	285,741	6,775,392	19,743,359	2,534,601	-	27,588,313

Table 7-62a. Ex-vessel revenue projections by major sector

Ex-vessel Revenue (million $)	2005	No Action	Alternative 1	Alternative 2	Alternative 3	Council Preferred Alternative
Total West Coast Exvessel Revenue (including at-sea and tribal)	279.4	279.5	254.4	270.2	277.4	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)	64.4	64.2	40.6	56.1	62.5	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)	47.5	47.2	27.2	42.4	48.5	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting	33.5	32.5	19.4	31.5	34.3	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting	22.2	21.1	13.4	23.2	23.4	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)	25.2	26.1	13.8	19.2	25.1	
LE Fixed Gear Groundfish Exvessel Revenue	10.7	10.7	8.2	8.4	8.4	
Open Access Groundfish Exvessel Revenue	6.3	6.3	5.1	5.4	5.6	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)	4.8	5.2	4.5	4.5	4.8	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)	2.6	2.6	1.8	2.0	2.6	
Change compared to No Action (million $)						
Total West Coast Exvessel Revenue (including at-sea and tribal)			- 25.1	- 9.3	- 2.1	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)			- 23.7	- 8.1	- 1.7	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)			- 20.0	- 4.8	+ 1.3	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting			- 13.1	- 0.9	+ 1.9	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting			- 7.7	+ 2.1	+ 2.3	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)			- 12.3	- 6.9	- 1.0	
LE Fixed Gear Groundfish Exvessel Revenue			- 2.5	- 2.3	- 2.3	
Open Access Groundfish Exvessel Revenue			- 1.2	- 1.0	- 0.8	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)			- 0.7	- 0.7	- 0.4	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)			- 0.7	- 0.5	+ 0.0	
Change compared to No Action (%)						
Total West Coast Exvessel Revenue (including at-sea and tribal)			-9.0%	-3.3%	-0.8%	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)			-36.9%	-12.6%	-2.7%	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)			-42.4%	-10.3%	+2.7%	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting			-40.3%	-2.9%	+5.8%	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting			-36.6%	+9.9%	+11.0%	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)			-47.0%	-26.5%	-3.9%	
LE Fixed Gear Groundfish Exvessel Revenue			-23.3%	-21.3%	-21.2%	
Open Access Groundfish Exvessel Revenue			-18.7%	-15.3%	-12.0%	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)			-14.2%	-12.5%	-7.5%	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)			-28.3%	-21.2%	+0.0%	

Table 7-62b. Commercial harvest projection by major sector.

Landings and Deliveries (thousand mt)	2005	No Action	Alternative 1	Alternative 2	Alternative 3	Council Preferred Alternative
Total West Coast Landings (includes at-sea and tribal)	503.0	510.0	382.8	443.3	503.5	
Non-Tribal Groundfish Landings and Deliveries (includes at-sea)	247.9	254.9	137.4	195.4	248.2	
Total LE Trawl Groundfish Landings and Deliveries (includes at-sea)	243.4	250.4	133.8	191.7	244.5	
Shoreside LE Trawl Groundfish Landings Including Whiting	115.6	115.3	62.0	92.4	114.7	
Shoreside LE Trawl Groundfish Landings Excluding Whiting	19.3	18.4	10.9	21.3	21.6	
LE Trawl Whiting Landings and Deliveries (shoreside and at-sea)	224.2	232.0	122.9	170.4	222.9	
LE Fixed Gear Groundfish Landings	2.8	2.9	2.3	2.3	2.3	
Open Access Groundfish Landings	1.6	1.6	1.3	1.4	1.4	
Tribal Groundfish Shoreside Landings (including whiting)	13.7	13.9	10.8	11.6	14.1	
Tribal Groundfish At-Sea Deliveries (whiting)	23.6	23.3	16.7	18.4	23.3	
Change compared to No Action (thousand mt)						
Total West Coast Landings (includes at-sea and tribal)			- 127.1	- 66.7	- 6.5	
Non-Tribal Groundfish Landings and Deliveries (includes at-sea)			- 117.5	- 59.5	- 6.7	
Total LE Trawl Groundfish Landings and Deliveries (includes at-sea)			- 116.6	- 58.7	- 5.9	
Shoreside LE Trawl Groundfish Landings Including Whiting			- 53.3	- 23.0	- 0.6	
Shoreside LE Trawl Groundfish Landings Excluding Whiting			- 7.5	+ 2.9	+ 3.2	
LE Trawl Whiting Landings and Deliveries (shoreside and at-sea)			- 109.0	- 61.5	- 9.1	
LE Fixed Gear Groundfish Landings			- 0.6	- 0.6	- 0.6	
Open Access Groundfish Landings			- 0.3	- 0.3	- 0.2	
Tribal Groundfish Shoreside Landings (including whiting)			- 3.1	- 2.3	+ 0.2	
Tribal Groundfish At-Sea Deliveries (whiting)			- 6.6	- 5.0	+ 0.0	
Change compared to No Action (%)						
Total West Coast Landings (includes at-sea and tribal)			-24.9%	-13.1%	-1.3%	
Non-Tribal Groundfish Landings and Deliveries (includes at-sea)			-46.1%	-23.3%	-2.6%	
Total LE Trawl Groundfish Landings and Deliveries (includes at-sea)			-46.5%	-23.4%	-2.4%	
Shoreside LE Trawl Groundfish Landings Including Whiting			-46.2%	-19.9%	-0.5%	
Shoreside LE Trawl Groundfish Landings Excluding Whiting			-40.9%	15.6%	17.2%	
LE Trawl Whiting Landings and Deliveries (shoreside and at-sea)			-47.0%	-26.5%	-3.9%	
LE Fixed Gear Groundfish Landings			-21.1%	-19.8%	-19.5%	
Open Access Groundfish Landings			-18.8%	-16.7%	-14.6%	
Tribal Groundfish Shoreside Landings (including whiting)			-22.1%	-16.2%	1.6%	
Tribal Groundfish At-Sea Deliveries (whiting)			-28.3%	-21.2%	0.0%	

Table 7-62c. Commercial income impact by major sector.

Income Impacts (million $)	2005	No Action	Alternative 1	Alternative 2	Alternative 3	Council Preferred Alternative
Total West Coast Income Impacts (including at sea and tribal)	624.1	625.2	567.0	602.0	621.8	
Non-Tribal Groundfish Income Impacts (including at-sea)	139.4	140.0	83.8	118.4	136.9	
Total LE Trawl Groundfish Income Impacts (including at sea)	115.0	115.5	64.6	98.6	116.7	
Shoreside LE Trawl Groundfish Income Impacts Including Whiting	81.4	79.9	45.8	72.5	82.6	
Shoreside LE Trawl Groundfish Income Impacts Excluding whiting	38.9	37.2	23.1	41.1	41.5	
LE Trawl Whiting Income Impacts (shoreside and at-sea)	76.1	78.3	41.5	57.5	75.2	
LE Fixed Gear Groundfish Income Impacts	15.3	15.4	11.9	12.2	12.2	
Open Access Groundfish Income Impacts	9.1	9.1	7.3	7.6	7.9	
Tribal Groundfish Shoreside Income Impacts (including whiting)	11.8	12.3	10.2	10.7	12.0	
Tribal Groundfish At-Sea Income Impacts (whiting)	8.0	7.9	5.6	6.2	7.9	
Change compared to No Action (million $)						
Total West Coast Income Impacts (including at sea and tribal)			- 58.2	- 23.3	- 3.4	
Non-Tribal Groundfish Income Impacts (including at-sea)			- 56.1	- 21.6	- 3.1	
Total LE Trawl Groundfish Income Impacts (including at sea)			- 50.9	- 16.9	+ 1.3	
Shoreside LE Trawl Groundfish Income Impacts Including Whiting			- 34.2	- 7.5	+ 2.6	
Shoreside LE Trawl Groundfish Income Impacts Excluding whiting			- 14.1	+ 3.9	+ 4.3	
LE Trawl Whiting Income Impacts (shoreside and at-sea)			- 36.8	- 20.8	- 3.1	
LE Fixed Gear Groundfish Income Impacts			- 3.5	- 3.2	- 3.2	
Open Access Groundfish Income Impacts			- 1.7	- 1.4	- 1.1	
Tribal Groundfish Shoreside Income Impacts (including whiting)			- 2.1	- 1.7	- 0.3	
Tribal Groundfish At-Sea Income Impacts (whiting)			- 2.2	- 1.7	- 0.0	
Change compared to No Action (%)						
Total West Coast Income Impacts (including at sea and tribal)			-9.3%	-3.7%	-0.5%	
Non-Tribal Groundfish Income Impacts (including at-sea)			-40.1%	-15.4%	-2.2%	
Total LE Trawl Groundfish Income Impacts (including at sea)			-44.0%	-14.6%	+1.1%	
Shoreside LE Trawl Groundfish Income Impacts Including Whiting			-42.7%	-9.4%	+3.3%	
Shoreside LE Trawl Groundfish Income Impacts Excluding whiting			-37.8%	+10.4%	+11.6%	
LE Trawl Whiting Income Impacts (shoreside and at-sea)			-47.0%	-26.5%	-3.9%	
LE Fixed Gear Groundfish Income Impacts			-23.0%	-21.0%	-20.9%	
Open Access Groundfish Income Impacts			-19.0%	-15.7%	-12.5%	
Tribal Groundfish Shoreside Income Impacts (including whiting)			-17.2%	-13.6%	-2.7%	
Tribal Groundfish At-Sea Income Impacts (whiting)			-28.3%	-21.2%	-0.0%	

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-63a. Ex-vessel revenue projections by State, port area, and major sector. (Page 1 of 2)

	WASHINGTON					OREGON				
Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WA TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OR TOTAL
2005										
Shoreside LE Trawl	2.19	0.50	4.26	-	6.95	8.61	6.90	3.05	0.85	19.41
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.02	0.61	1.12	-	3.76	0.84	1.54	1.22	0.58	4.18
Open Access	0.02	0.12	0.53	-	0.67	0.29	0.07	0.34	1.21	1.90
Tribal Groundfish	0.24	2.73	1.28	0.60	4.84	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.91	9.09	50.84	7.15	75.98	31.68	24.17	18.73	10.13	84.71
No Action (2006)										
Shoreside LE Trawl	1.87	0.45	4.23	-	6.56	8.28	6.88	2.95	0.83	18.94
At Sea Whiting	-		-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.04	0.61	1.13	-	3.78	0.85	1.55	1.23	0.58	4.21
Open Access	0.02	0.12	0.53	-	0.67	0.29	0.07	0.35	1.20	1.90
Tribal Groundfish	0.25	3.05	1.27	0.62	5.19	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.63	9.37	50.81	7.16	75.97	31.35	24.16	18.64	10.12	84.27
Alternative 1										
Shoreside LE Trawl	1.25	0.30	2.29	-	3.83	4.97	3.85	1.80	0.51	11.12
At Sea Whiting	-		-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	1.56	0.46	0.85	-	2.87	0.64	1.16	0.92	0.45	3.17
Open Access	0.02	0.09	0.40	-	0.51	0.24	0.06	0.27	0.98	1.54
Tribal Groundfish	0.24	2.77	0.97	0.48	4.45	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	7.50	8.74	48.15	7.03	71.43	27.78	20.73	17.11	9.43	75.06
Alternative 2										
Shoreside LE Trawl	1.98	0.44	3.26	-	5.68	8.35	5.76	3.15	0.94	18.21
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	1.56	0.46	0.85	-	2.88	0.64	1.16	0.92	0.45	3.18
Open Access	0.02	0.09	0.40	-	0.51	0.24	0.06	0.27	1.03	1.59
Tribal Groundfish	0.24	2.77	1.05	0.48	4.54	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.24	8.89	49.21	7.03	73.37	31.17	22.64	18.47	9.92	82.19
Alternative 3										
Shoreside LE Trawl	2.00	0.45	4.14	-	6.60	8.89	6.85	3.27	0.95	19.96
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	1.56	0.46	0.85	-	2.88	0.64	1.16	0.92	0.45	3.18
Open Access	0.02	0.09	0.40	-	0.51	0.24	0.06	0.27	1.08	1.64
Tribal Groundfish	0.24	2.77	1.32	0.48	4.80	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.27	8.90	50.36	7.03	74.56	31.71	23.74	18.58	9.98	84.00

Table 7-63a. Ex-vessel revenue projections by State, port area, and major sector. (Page 2 of 2)

	CALIFORNIA									
Alternative / Fishery	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CA TOTAL
2005										
Shoreside LE Trawl	0.73	2.55	1.78	0.80	0.79	0.50	-	-	-	7.15
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.22	0.31	0.24	0.20	0.42	-	0.26	0.74	0.32	2.72
Open Access	0.37	0.25	0.97	0.26	0.53	0.95	0.14	0.09	0.18	3.74
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.22	5.55	5.28	19.54	8.28	2.93	22.68	28.49	5.11	102.08
No Action (2006)										
Shoreside LE Trawl	0.70	2.43	1.83	0.71	0.83	0.47	-	-	-	6.96
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.22	0.31	0.24	0.20	0.42	-	0.26	0.74	0.32	2.72
Open Access	0.37	0.25	0.98	0.26	0.53	0.95	0.14	0.09	0.18	3.75
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.20	5.44	5.33	19.44	8.32	2.90	22.68	28.49	5.10	101.90
Alternative 1										
Shoreside LE Trawl	0.42	1.55	1.11	0.47	0.58	0.31	-	-	-	4.43
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.18	0.24	0.18	0.16	0.35	-	0.21	0.59	0.25	2.18
Open Access	0.33	0.20	0.76	0.22	0.44	0.78	0.13	0.09	0.15	3.09
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	3.84	4.42	4.34	19.13	7.91	2.57	22.61	28.34	5.01	98.17
Alternative 2										
Shoreside LE Trawl	0.78	2.60	2.12	0.74	0.91	0.50	-	-	-	7.64
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.18	0.24	0.18	0.16	0.35	-	0.24	0.71	0.30	2.38
Open Access	0.35	0.20	0.78	0.24	0.45	0.86	0.14	0.09	0.16	3.26
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.21	5.47	5.37	19.41	8.26	2.85	22.66	28.46	5.06	101.73
Alternative 3										
Shoreside LE Trawl	0.78	2.69	2.14	0.75	0.91	0.51	-	-	-	7.77
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.18	0.24	0.18	0.17	0.35	-	0.24	0.71	0.30	2.38
Open Access	0.37	0.20	0.80	0.25	0.46	0.95	0.14	0.09	0.16	3.42
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.24	5.56	5.40	19.43	8.27	2.94	22.66	28.46	5.06	102.03

Table 7-63b. Change in ex-vessel revenue projections by State, port area, and major sector. (Page 1 of 2)

Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WA TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OR TOTAL
	WASHINGTON					OREGON				
No Action (2006)										
Shoreside LE Trawl	*1.87*	*0.45*	*4.23*	-	*6.56*	*8.28*	*6.88*	*2.95*	*0.83*	*18.94*
At Sea Whiting	-	-	-	-	*0.00*	-	-	-	-	*0.00*
LE Fixed Gear	*2.04*	*0.61*	*1.13*	-	*3.78*	*0.85*	*1.55*	*1.23*	*0.58*	*4.21*
Open Access	*0.02*	*0.12*	*0.53*	-	*0.67*	*0.29*	*0.07*	*0.35*	*1.20*	*1.90*
Tribal Groundfish	*0.25*	*3.05*	*1.27*	*0.62*	*5.19*	-	-	-	-	*0.00*
Tribal Non-Groundfish	*0.71*	*3.00*	*0.23*	*6.53*	*10.47*	-	-	-	-	*0.00*
Non Groundfish	*3.73*	*2.13*	*43.42*	*0.01*	*49.29*	*21.94*	*15.66*	*14.12*	*7.49*	*59.22*
TOTAL	*8.63*	*9.37*	*50.81*	*7.16*	*75.97*	*31.35*	*24.16*	*18.64*	*10.12*	*84.27*
Alternative 1										
Shoreside LE Trawl	-0.63	-0.15	-1.95	-	-2.73	-3.31	-3.03	-1.15	-0.32	-7.82
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.48	-0.15	-0.28	-	-0.91	-0.21	-0.39	-0.31	-0.14	-1.04
Open Access	0.00	-0.03	-0.13	-	-0.17	-0.05	-0.01	-0.08	-0.22	-0.36
Tribal Groundfish	-0.02	-0.29	-0.30	-0.14	-0.74	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-1.13	-0.62	-2.66	-0.14	-4.54	-3.57	-3.43	-1.53	-0.68	-9.21
Alternative 2										
Shoreside LE Trawl	0.11	-0.01	-0.98	-	-0.88	+0.07	-1.12	+0.21	+0.11	-0.73
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.47	-0.15	-0.28	-	-0.90	-0.21	-0.39	-0.31	-0.14	-1.04
Open Access	0.00	-0.03	-0.13	-	-0.16	-0.05	-0.01	-0.08	-0.17	-0.31
Tribal Groundfish	-0.02	-0.29	-0.21	-0.14	-0.65	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.39	-0.47	-1.60	-0.14	-2.60	-0.19	-1.52	-0.17	-0.20	-2.08
Alternative 3										
Shoreside LE Trawl	0.13	+0.00	-0.10	-	+0.04	+0.61	-0.03	+0.32	+0.11	+1.02
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.47	-0.15	-0.28	-	-0.90	-0.21	-0.38	-0.31	-0.13	-1.03
Open Access	0.00	-0.03	-0.13	-	-0.16	-0.05	-0.01	-0.08	-0.12	-0.26
Tribal Groundfish	-0.02	-0.29	+0.05	-0.14	-0.39	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.36	-0.46	-0.45	-0.14	-1.41	+0.35	-0.42	-0.06	-0.14	-0.27

Table 7-63b. Change in ex-vessel revenue projections by State, port area, and major sector. (Page 2 of 2)

CALIFORNIA

Alternative / Fishery	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CA TOTAL
No Action (2006)										
Shoreside LE Trawl	*0.70*	*2.43*	*1.83*	*0.71*	*0.83*	*0.47*	-	-	-	*6.96*
At Sea Whiting	-	-	-	-	-	-	-	-	-	*0.00*
LE Fixed Gear	*0.22*	*0.31*	*0.24*	*0.20*	*0.42*	-	*0.26*	*0.74*	*0.32*	*2.72*
Open Access	*0.37*	*0.25*	*0.98*	*0.26*	*0.53*	*0.95*	*0.14*	*0.09*	*0.18*	*3.75*
Tribal Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Non Groundfish	*2.91*	*2.44*	*2.29*	*18.27*	*6.55*	*1.48*	*22.27*	*27.66*	*4.60*	*88.47*
TOTAL	*4.20*	*5.44*	*5.33*	*19.44*	*8.32*	*2.90*	*22.68*	*28.49*	*5.10*	*101.90*
Alternative 1										
Shoreside LE Trawl	-0.27	-0.89	-0.72	-0.24	-0.25	-0.16	-	-	-	-2.52
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.05	-0.08	-0.06	-0.04	-0.07	-	-0.05	-0.14	-0.07	-0.55
Open Access	-0.03	-0.05	-0.22	-0.04	-0.09	-0.17	-0.02	-0.00	-0.03	-0.66
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.35	-1.02	-1.00	-0.31	-0.41	-0.33	-0.07	-0.15	-0.10	-3.73
Alternative 2										
Shoreside LE Trawl	+0.08	+0.16	+0.29	+0.03	+0.08	+0.03	-	-	-	+0.68
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.04	-0.08	-0.06	-0.04	-0.07	-	-0.02	-0.03	-0.02	-0.35
Open Access	-0.02	-0.05	-0.20	-0.02	-0.08	-0.09	-0.01	-0.00	-0.03	-0.50
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	+0.02	+0.03	+0.03	-0.03	-0.06	-0.05	-0.02	-0.03	-0.04	-0.16
Alternative 3										
Shoreside LE Trawl	+0.09	+0.25	+0.31	+0.04	+0.08	+0.04	-	-	-	+0.81
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.04	-0.07	-0.06	-0.04	-0.07	-	-0.02	-0.03	-0.02	-0.34
Open Access	-0.00	-0.05	-0.18	-0.01	-0.06	-0.00	-0.00	-0.00	-0.03	-0.34
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	+0.04	+0.13	+0.07	-0.01	-0.04	+0.04	-0.02	-0.03	-0.04	+0.14

Table 7-64a. Estimated income impact projections by State, port area, and major sector. (Page 1 of 2)

	WASHINGTON					OREGON					
Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WA TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OR TOTAL
2005										
Shoreside LE Trawl	4.14	0.89	18.72	-	23.76	17.86	18.49	5.77	1.37	43.48
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	3.21	0.86	1.62	-	5.70	1.09	2.06	1.63	0.77	5.55
Open Access	0.04	0.18	0.78	-	1.00	0.37	0.09	0.49	1.50	2.46
Tribal Groundfish	0.39	4.26	6.45	0.71	11.81	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	15.88	13.80	108.95	9.46	148.09	95.14	44.40	30.32	15.89	185.75
No Action (2006)										
Shoreside LE Trawl	3.61	0.81	18.77	-	23.19	17.32	18.52	5.62	1.35	42.82
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	3.23	0.87	1.64	-	5.74	1.09	2.08	1.64	0.77	5.59
Open Access	0.04	0.18	0.79	-	1.01	0.37	0.09	0.49	1.50	2.45
Tribal Groundfish	0.42	4.80	6.38	0.74	12.34	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	15.40	14.26	108.94	9.49	148.10	94.62	44.45	30.19	15.87	185.12
Alternative 1										
Shoreside LE Trawl	2.29	0.50	10.03	-	12.83	9.93	10.10	3.36	0.83	24.22
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.52	0.66	1.23	-	4.40	0.82	1.56	1.23	0.59	4.21
Open Access	0.03	0.14	0.59	-	0.75	0.31	0.08	0.38	1.22	1.99
Tribal Groundfish	0.43	4.47	4.74	0.58	10.22	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	13.37	13.37	97.96	9.33	134.03	86.89	35.50	27.41	14.88	164.67
Alternative 2										
Shoreside LE Trawl	3.81	0.80	14.05	-	18.66	16.64	14.80	5.86	1.53	38.83
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.52	0.66	1.23	-	4.41	0.82	1.56	1.23	0.59	4.21
Open Access	0.03	0.14	0.59	-	0.76	0.31	0.08	0.38	1.28	2.04
Tribal Groundfish	0.43	4.47	5.19	0.58	10.66	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	14.89	13.67	102.44	9.33	140.33	93.59	40.20	29.91	15.65	179.35
Alternative 3										
Shoreside LE Trawl	3.87	0.82	18.16	-	22.86	18.32	18.23	6.18	1.54	44.27
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.52	0.66	1.23	-	4.42	0.82	1.56	1.23	0.60	4.22
Open Access	0.03	0.14	0.60	-	0.77	0.31	0.08	0.38	1.33	2.10
Tribal Groundfish	0.43	4.47	6.54	0.58	12.01	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	14.96	13.69	107.90	9.33	145.89	95.28	43.63	30.24	15.72	184.85

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-64a. Estimated income impact projections by State, port area, and major sector. (Page 2 of 2)

Alternative / Fishery	CALIFORNIA									
	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CA TOTAL
2005										
Shoreside LE Trawl	1.27	5.46	3.35	1.53	1.53	0.98	-	-	-	14.12
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.36	0.50	0.37	0.34	0.68	-	0.37	1.08	0.39	4.09
Open Access	0.51	0.40	1.53	0.41	0.83	1.34	0.21	0.12	0.25	5.59
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.15	10.39	8.82	35.45	24.36	4.60	57.66	99.65	8.36	256.44
No Action (2006)										
Shoreside LE Trawl	1.23	5.29	3.50	1.38	1.60	0.95	-	-	-	13.94
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.36	0.50	0.37	0.34	0.68	-	0.37	1.08	0.39	4.10
Open Access	0.51	0.40	1.54	0.41	0.83	1.34	0.21	0.12	0.24	5.61
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.11	10.23	8.98	35.29	24.44	4.56	57.66	99.65	8.36	256.27
Alternative 1										
Shoreside LE Trawl	0.73	3.26	2.13	0.91	1.09	0.62	-	-	-	8.74
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.29	0.38	0.28	0.27	0.57	-	0.30	0.87	0.31	3.27
Open Access	0.46	0.31	1.18	0.36	0.69	1.10	0.19	0.11	0.21	4.61
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	6.49	7.99	7.17	34.70	23.68	3.99	57.56	99.43	8.24	249.25
Alternative 2										
Shoreside LE Trawl	1.38	5.36	4.04	1.45	1.72	1.02	-	-	-	14.97
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.29	0.38	0.28	0.28	0.57	-	0.35	1.04	0.37	3.55
Open Access	0.49	0.31	1.21	0.38	0.71	1.22	0.20	0.11	0.21	4.84
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.16	10.09	9.11	35.27	24.32	4.52	57.63	99.60	8.31	255.99
Alternative 3										
Shoreside LE Trawl	1.39	5.73	4.07	1.47	1.76	1.04	-	-	-	15.45
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.29	0.39	0.28	0.28	0.57	-	0.35	1.04	0.37	3.56
Open Access	0.51	0.32	1.24	0.40	0.73	1.33	0.21	0.11	0.21	5.06
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.20	10.47	9.17	35.30	24.38	4.65	57.64	99.60	8.31	256.70

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-64b. Change in estimated income impact projections by State, port area, and major sector. (Page 1 of 2)

	WASHINGTON					OREGON				
Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WASHINGTON TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OREGON TOTAL
No Action (2006)										
Shoreside LE Trawl	*3.61*	*0.81*	*18.77*	-	*23.19*	*17.32*	*18.52*	*5.62*	*1.35*	*42.82*
At Sea Whiting	-	-	-	-	*0.00*	-	-	-	-	*0.00*
LE Fixed Gear	*3.23*	*0.87*	*1.64*	-	*5.74*	*1.09*	*2.08*	*1.64*	*0.77*	*5.59*
Open Access	*0.04*	*0.18*	*0.79*	-	*1.01*	*0.37*	*0.09*	*0.49*	*1.50*	*2.45*
Tribal Groundfish	*0.42*	*4.80*	*6.38*	*0.74*	*12.34*	-	-	-	-	*0.00*
Tribal Non-Groundfish	*1.15*	*4.39*	*0.41*	*8.73*	*14.68*	-	-	-	-	*0.00*
Non Groundfish	*6.95*	*3.21*	*80.96*	*0.02*	*91.14*	*75.82*	*23.76*	*22.44*	*12.25*	*134.26*
TOTAL	*15.40*	*14.26*	*108.94*	*9.49*	*148.10*	*94.62*	*44.45*	*30.19*	*15.87*	*185.12*
Alternative 1										
Shoreside LE Trawl	-1.31	-0.31	-8.73	-	-10.36	-7.39	-8.42	-2.26	-0.53	-18.60
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.71	-0.21	-0.41	-	-1.33	-0.27	-0.52	-0.41	-0.19	-1.38
Open Access	-0.01	-0.04	-0.20	-	-0.25	-0.07	-0.01	-0.11	-0.28	-0.47
Tribal Groundfish	0.01	-0.33	-1.64	-0.16	-2.13	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-2.03	-0.90	-10.98	-0.16	-14.07	-7.73	-8.95	-2.78	-0.99	-20.45
Alternative 2	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.20	-0.01	-4.71	-	-4.52	-0.69	-3.72	0.24	0.18	-3.99
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.71	-0.21	-0.40	-	-1.32	-0.27	-0.52	-0.41	-0.18	-1.38
Open Access	-0.01	-0.04	-0.20	-	-0.25	-0.07	-0.01	-0.11	-0.22	-0.41
Tribal Groundfish	0.01	-0.33	-1.19	-0.16	-1.68	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.51	-0.60	-6.51	-0.16	-7.77	-1.02	-4.26	-0.28	-0.22	-5.78
Alternative 3	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.27	0.01	-0.60	-	-0.33	0.99	-0.29	0.56	0.19	1.46
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.71	-0.21	-0.40	-	-1.32	-0.27	-0.52	-0.41	-0.18	-1.37
Open Access	-0.01	-0.04	-0.19	-	-0.24	-0.06	-0.01	-0.11	-0.17	-0.36
Tribal Groundfish	0.01	-0.33	0.15	-0.16	-0.33	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.44	-0.57	-1.04	-0.16	-2.21	0.66	-0.82	0.05	-0.15	-0.27

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-64b. Change in estimated income impact projections by State, port area, and major sector. (Page 2 of 2)

	CALIFORNIA									
Alternative / Fishery	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CALIFORNIA TOTAL
No Action (2006)										
Shoreside LE Trawl	*1.23*	*5.29*	*3.50*	*1.38*	*1.60*	*0.95*	-	-	-	*13.94*
At Sea Whiting	-	-	-	-	-	-	-	-	-	*0.00*
LE Fixed Gear	*0.36*	*0.50*	*0.37*	*0.34*	*0.68*	-	*0.37*	*1.08*	*0.39*	*4.10*
Open Access	*0.51*	*0.40*	*1.54*	*0.41*	*0.83*	*1.34*	*0.21*	*0.12*	*0.24*	*5.61*
Tribal Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Non Groundfish	*5.01*	*4.03*	*3.58*	*33.16*	*21.32*	*2.28*	*57.08*	*98.45*	*7.72*	*232.63*
TOTAL	*7.11*	*10.23*	*8.98*	*35.29*	*24.44*	*4.56*	*57.66*	*99.65*	*8.36*	*256.27*
Alternative 1										
Shoreside LE Trawl	-0.49	-2.03	-1.37	-0.47	-0.50	-0.33	-	-	-	-5.20
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.08	-0.12	-0.09	-0.07	-0.11	-	-0.07	-0.21	-0.08	-0.83
Open Access	-0.05	-0.09	-0.35	-0.06	-0.14	-0.24	-0.02	-0.01	-0.04	-1.00
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.62	-2.24	-1.81	-0.60	-0.76	-0.57	-0.09	-0.21	-0.12	-7.02
Alternative 2	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.15	0.07	0.54	0.08	0.12	0.07	-	-	-	1.03
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.07	-0.12	-0.09	-0.07	-0.11	-	-0.02	-0.04	-0.02	-0.55
Open Access	-0.02	-0.09	-0.33	-0.04	-0.13	-0.12	-0.01	0.00	-0.03	-0.77
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	0.05	-0.14	0.13	-0.03	-0.12	-0.05	-0.03	-0.04	-0.05	-0.28
Alternative 3	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.16	0.44	0.57	0.09	0.16	0.09	-	-	-	1.52
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.07	-0.11	-0.09	-0.07	-0.11	-	-0.02	-0.04	-0.02	-0.54
Open Access	0.00	-0.09	-0.30	-0.01	-0.11	0.00	0.00	0.00	-0.03	-0.54
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	0.09	0.24	0.19	0.01	-0.06	0.08	-0.02	-0.04	-0.05	0.43

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-65a. Projected recreational effort by region in 2004 and 2005 and by alternative.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Counc Preferre Al
North Washington Coast	52,055	46,978	46,978	33,793	36,456	42,029	
South & Central WA Coast	145,568	125,737	125,737	125,737	125,737	125,737	
Astoria-Tillamook	58,251	40,764	41,794	37,073	41,794	41,794	
Newport	72,331	55,368	58,487	46,177	58,487	58,487	
Coos Bay	50,990	36,238	39,152	35,175	39,152	39,152	
Brookings	35,382	34,128	35,817	27,008	35,817	35,817	
Crescent City-Eureka	47,314	60,292	47,133	42,035	47,133	47,133	
Fort Bragg	52,197	66,162	45,684	36,678	39,153	48,594	
Bodega Bay - San Francisco	108,659	82,922	87,127	56,185	59,618	92,772	
Monterey - Morro Bay	120,830	99,709	114,155	72,564	74,411	138,561	
Santa Barbara	108,104	64,964	67,401	52,335	58,836	72,775	
Los Angeles - San Diego	786,589	500,488	507,907	464,355	483,195	523,296	
TOTAL	1,638,269	1,213,750	1,217,372	1,029,116	1,099,789	1,266,147	

Table 7-65b. Change in projected effort across alternatives.

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	*46,978*	-13,185	-10,522	-4,949	
South & Central WA Coast	*125,737*	-	-	-	
Astoria-Tillamook	*41,794*	-4,720	-	-	
Newport	*58,487*	-12,310	-	-	
Coos Bay	*39,152*	-3,977	0	0	
Brookings	*35,817*	-8,809	-	-	
Crescent City-Eureka	*47,133*	-5,098	-	-	
Fort Bragg	*45,684*	-9,006	-6,530	2,910	
Bodega Bay - San Francisco	*87,127*	-30,942	-27,510	5,644	
Monterey - Morro Bay	*114,155*	-41,591	-39,744	24,406	
Santa Barbara	*67,401*	-15,065	-8,564	5,374	
Los Angeles - San Diego	*507,907*	-43,553	-24,712	15,389	
TOTAL	*1,217,372*	-188,256	-117,582	48,775	

Table 7-66a. Projected angler expenditures by region in 2004 and 2005 and by alternatives.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	3.4	3.0	3.0	2.1	2.3	2.7	
South & Central WA Coast	15.7	14.4	14.4	14.4	14.4	14.4	
Astoria-Tillamook	4.4	3.4	3.4	2.9	3.4	3.4	
Newport	7.7	6.4	6.7	5.0	6.7	6.7	
Coos Bay	3.8	2.8	2.9	2.5	2.9	2.9	
Brookings	2.4	2.4	2.5	1.8	2.5	2.5	
Crescent City-Eureka	2.8	3.0	2.6	2.3	2.6	2.6	
Fort Bragg	4.1	3.6	2.9	2.1	2.3	3.1	
Bodega Bay - San Francisco	10.1	7.7	10.0	5.8	6.1	10.7	
Monterey - Morro Bay	10.2	7.1	11.3	6.1	6.3	13.7	
Santa Barbara	10.8	5.9	6.4	4.9	5.6	6.8	
Los Angeles - San Diego	81.0	45.4	46.7	42.4	44.4	48.0	
TOTAL	156	105	113	92	99	118	

Table 7-66b. Change in projected angler expenditures across alternatives.

Region	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	3.0	-0.9	-0.7	-0.3	
South & Central WA Coast	14.4	-	-	-	
Astoria-Tillamook	3.4	-0.5	-	-	
Newport	6.7	-1.8	-	-	
Coos Bay	2.9	-0.4	-	-	
Brookings	2.5	-0.7	-	-	
Crescent City-Eureka	2.6	-0.3	-	-	
Fort Bragg	2.9	-0.8	-0.6	0.2	
Bodega Bay - San Francisco	10.0	-4.2	-3.9	0.7	
Monterey - Morro Bay	11.3	-5.2	-5.0	2.4	
Santa Barbara	6.4	-1.5	-0.8	0.4	
Los Angeles - San Diego	46.7	-4.3	-2.4	1.3	
TOTAL	113	-21	-13	5	

Table 7-67a. Projected recreational income impacts by region in 2004 and 2005, and by alternatives.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Preferred
North Washington Coast	2.6	2.4	2.4	1.7	1.8	2.1	
South & Central WA Coast	13.2	12.1	12.1	12.1	12.1	12.1	
Astoria-Tillamook	3.3	2.5	2.6	2.2	2.6	2.6	
Newport	5.9	5.0	5.2	3.9	5.2	5.2	
Coos Bay	2.8	2.1	2.2	1.9	2.2	2.2	
Brookings	1.8	1.8	1.9	1.3	1.9	1.9	
Crescent City-Eureka	2.3	2.4	2.1	1.9	2.1	2.1	
Fort Bragg	3.4	2.9	2.3	1.7	1.8	2.5	
Bodega Bay - San Francisco	8.4	6.4	8.4	4.8	5.1	9.0	
Monterey - Morro Bay	7.9	5.5	8.7	4.7	4.9	10.6	
Santa Barbara	8.4	4.6	4.9	3.8	4.3	5.3	
Los Angeles - San Diego	62.6	35.1	36.1	32.8	34.3	37.1	
TOTAL	123	83	89	73	78	93	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-67b. Change in recreational income impacts by region by alternative.

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	*2.4*	-0.7	-0.6	-0.2	
South & Central WA Coast	*12.1*	-	-	-	
Astoria-Tillamook	*2.6*	-0.4	-	-	
Newport	*5.2*	-1.4	-	-	
Coos Bay	*2.2*	-0.3	-	-	
Brookings	*1.9*	-0.5	-	-	
Crescent City-Eureka	*2.1*	-0.2	-	-	
Fort Bragg	*2.3*	-0.6	-0.5	0.2	
Bodega Bay - San Francisco	*8.4*	-3.6	-3.3	0.6	
Monterey - Morro Bay	*8.7*	-4.0	-3.9	1.8	
Santa Barbara	*4.9*	-1.1	-0.6	0.3	
Los Angeles - San Diego	*36.1*	-3.4	-1.8	1.0	
TOTAL	*89*	-16	-11	4	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68a. Projected recreation employment impacts by region by alternative.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	118	106	106	74	80	96	
South & Central WA Coast	591	546	546	546	546	546	
Astoria-Tillamook	149	114	117	99	117	117	
Newport	267	225	236	173	236	236	
Coos Bay	126	93	99	84	99	99	
Brookings	81	79	83	60	83	83	
Crescent City-Eureka	90	95	82	74	82	82	
Fort Bragg	135	115	93	68	72	99	
Bodega Bay - San Francisco	333	254	333	191	203	356	
Monterey - Morro Bay	273	191	303	164	168	367	
Santa Barbara	291	158	171	131	149	183	
Los Angeles - San Diego	2,171	1,217	1,254	1,138	1,190	1,288	
TOTAL	4,625	3,194	3,422	2,802	3,025	3,551	

*Employment impacts are a measure of employment generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68b. Change in recreation employment impacts by region by area.

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	*106*	-32	-26	-10	
South & Central WA Coast	*546*	-	-	-	
Astoria-Tillamook	*117*	-18	-	-	
Newport	*236*	-63	-	-	
Coos Bay	*99*	-15	-	-	
Brookings	*83*	-23	-	-	
Crescent City-Eureka	*82*	-8	-	-	
Fort Bragg	*93*	-25	-20	6	
Bodega Bay - San Francisco	*333*	-142	-131	22	
Monterey - Morro Bay	*303*	-138	-134	64	
Santa Barbara	*171*	-40	-22	12	
Los Angeles - San Diego	*1,254*	-116	-64	34	
TOTAL	*3,422*	-620	-397	129	

*Employment impacts are a measure of employment generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68c. Projected Recreational Employment impacts by state, region, and trip target by alternative.

State	Region	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
WASHINGTON									
	North Washington Coast								
		Groundfish	13	24	24	12	16	18	
		Halibut	41	39	39	18	21	35	
		Other	63	44	44	43	44	43	
		TOTAL	118	106	106	74	80	96	
	South & Central WA Coast								
		Groundfish	97	110	110	110	110	110	
		Halibut	33	29	29	29	29	29	
		Other	461	407	407	407	407	407	
		TOTAL	591	546	546	546	546	546	
WASHINGTON TOTALS									
		Groundfish	110	133	133	122	125	128	
		Halibut	75	67	67	47	50	63	
		Other	524	451	451	451	451	451	
		TOTAL	709	652	652	620	626	642	
OREGON									
	Astoria-Tillamook								
		Groundfish	33	42	44	27	44	44	
		Halibut	9	12	13	13	13	13	
		Other	106	60	59	59	59	59	
		TOTAL	149	114	117	99	117	117	
	Newport								
		Groundfish	118	150	158	96	158	158	
		Halibut	26	29	30	30	30	30	
		Other	123	46	47	47	47	47	
		TOTAL	267	225	236	173	236	236	
	Coos Bay								
		Groundfish	32	35	37	22	37	37	
		Halibut	7	6	6	6	6	6	
		Other	87	53	57	57	57	57	
		TOTAL	126	93	99	84	99	99	
	Brookings								
		Groundfish	45	56	59	36	59	59	
		Halibut	0	0	0	0	0	0	
		Other	36	23	24	24	24	24	
		TOTAL	81	79	83	60	83	83	
OREGON TOTALS									
		Groundfish	229	283	298	180	298	298	
		Halibut	43	47	50	50	50	50	
		Other	352	182	187	187	187	187	
		TOTAL	623	512	535	417	535	535	
CALIFORNIA									
	North Coast: Humboldt and Del Norte counties								
		Groundfish	70	93	79	71	79	79	
		Other	20	3	3	3	3	3	
		TOTAL	90	95	82	74	82	82	
	North-Central Coast: Sonoma and Mendocino counties								
		Groundfish	82	99	77	52	57	83	
		Other	53	16	16	16	16	16	
		TOTAL	135	115	93	68	72	99	
	North-Central Coast: San Mateo County up through Marin County								
		Groundfish	166	192	271	129	140	294	
		Other	168	62	62	62	62	62	
		TOTAL	333	254	333	191	203	356	
	South-Central Coast: San Luis Obispo County through Santa Cruz County								
		Groundfish	204	178	290	152	156	354	
		Other	69	13	13	13	13	13	
		TOTAL	273	191	303	164	168	367	
	South Coast: Ventura and Santa Barbara counties								
		Groundfish	114	94	106	67	84	118	
		Other	177	64	64	64	64	64	
		TOTAL	291	158	171	131	149	183	
	South Coast: San Diego County through Los Angeles County								
		Groundfish	338	275	312	196	248	347	
		Other	1,834	942	942	942	942	942	
		TOTAL	2,171	1,217	1,254	1,138	1,190	1,288	
CALIFORNIA TOTALS									
		Groundfish	973	931	1,136	666	765	1,275	
		Other	2,320	1,100	1,100	1,100	1,100	1,100	
		TOTAL	3,293	2,031	2,235	1,765	1,864	2,374	

Table 7-68d Projected West Coast Recreational Income by state, boat type and alternative

Estimated West Coast income impacts* resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2004 and 2005, and projected income impacts under the management alternatives (million $)

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State	Region	Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
WASHINGTON										
	North Washington Coast									
		Charter								
			Groundfish	0.03	0.12	0.12	0.06	0.07	0.10	
			Halibut	0.66	0.59	0.59	0.31	0.35	0.54	
			Other	0.47	0.33	0.33	0.33	0.33	0.33	
			TOTAL	1.16	1.04	1.04	0.70	0.75	0.96	
		Private								
			Groundfish	0.26	0.41	0.41	0.22	0.28	0.31	
			Halibut	0.26	0.27	0.27	0.10	0.12	0.23	
			Other	0.94	0.65	0.65	0.64	0.64	0.63	
			TOTAL	1.46	1.32	1.32	0.96	1.03	1.17	
	South & Central WA Coast									
		Charter								
			Groundfish	2.10	2.37	2.37	2.37	2.37	2.37	
			Halibut	0.74	0.62	0.62	0.62	0.62	0.62	
			Other	7.48	6.87	6.87	6.87	6.87	6.87	
			TOTAL	10.32	9.86	9.86	9.86	9.86	9.86	
		Private								
			Groundfish	0.06	0.07	0.07	0.07	0.07	0.07	
			Halibut	0.01	0.01	0.01	0.01	0.01	0.01	
			Other	2.76	2.20	2.20	2.20	2.20	2.20	
			TOTAL	2.83	2.28	2.28	2.28	2.28	2.28	
WASHINGTON TOTALS										
		Charter								
			Groundfish	2.13	2.49	2.49	2.43	2.44	2.47	
			Halibut	1.40	1.21	1.21	0.93	0.97	1.16	
			Other	7.95	7.20	7.20	7.20	7.19	7.20	
			TOTAL	11.48	10.90	10.90	10.56	10.61	10.83	
		Private								
			Groundfish	0.32	0.48	0.48	0.29	0.35	0.38	
			Halibut	0.27	0.28	0.28	0.11	0.13	0.25	
			Other	3.70	2.84	2.84	2.83	2.84	2.83	
			TOTAL	4.29	3.60	3.60	3.24	3.31	3.45	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-xx. Estimated West Coast income impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2004 and 2005, and projected income impacts under the management alternatives (million $) (page 2 of 3).

State	Region	Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
OREGON										
	Astoria-Tillamook									
		Charter								
			Groundfish	0.65	0.71	0.75	0.45	0.75	0.75	
			Halibut	0.15	0.21	0.22	0.22	0.22	0.22	
			Other	0.79	0.49	0.48	0.48	0.48	0.48	
			TOTAL	1.58	1.41	1.45	1.15	1.45	1.45	
		Private								
			Groundfish	0.09	0.23	0.24	0.15	0.24	0.24	
			Halibut	0.06	0.07	0.07	0.07	0.07	0.07	
			Other	1.58	0.83	0.84	0.84	0.84	0.84	
			TOTAL	1.73	1.13	1.16	1.06	1.16	1.16	
	Newport									
		Charter								
			Groundfish	2.48	3.08	3.25	1.96	3.25	3.25	
			Halibut	0.34	0.34	0.36	0.36	0.36	0.36	
			Other	1.66	0.63	0.60	0.60	0.60	0.60	
			TOTAL	4.47	4.05	4.22	2.93	4.22	4.22	
		Private								
			Groundfish	0.16	0.26	0.28	0.17	0.28	0.28	
			Halibut	0.25	0.30	0.32	0.32	0.32	0.32	
			Other	1.08	0.40	0.44	0.44	0.44	0.44	
			TOTAL	1.48	0.96	1.03	0.92	1.03	1.03	
	Coos Bay									
		Charter								
			Groundfish	0.60	0.58	0.61	0.37	0.61	0.61	
			Halibut	0.11	0.07	0.07	0.07	0.07	0.07	
			Other	0.57	0.37	0.35	0.35	0.35	0.35	
			TOTAL	1.27	1.01	1.03	0.79	1.03	1.03	
		Private								
			Groundfish	0.12	0.20	0.21	0.13	0.21	0.21	
			Halibut	0.05	0.05	0.06	0.06	0.06	0.06	
			Other	1.38	0.82	0.91	0.91	0.91	0.91	
			TOTAL	1.55	1.07	1.17	1.09	1.17	1.17	
	Brookings									
		Charter								
			Groundfish	0.58	0.63	0.67	0.40	0.67	0.67	
			Halibut	0.00	0.00	0.00	0.00	0.00	0.00	
			Other	0.11	0.05	0.05	0.05	0.05	0.05	
			TOTAL	0.69	0.69	0.72	0.46	0.72	0.72	
		Private								
			Groundfish	0.43	0.61	0.64	0.39	0.64	0.64	
			Halibut	0.00	0.00	0.00	0.00	0.00	0.00	
			Other	0.69	0.47	0.49	0.49	0.49	0.49	
			TOTAL	1.12	1.08	1.13	0.88	1.13	1.13	
OREGON TOTALS										
		Charter								
			Groundfish	4.30	5.00	5.27	3.19	5.27	5.27	
			Halibut	0.59	0.62	0.66	0.66	0.66	0.66	
			Other	3.12	1.53	1.49	1.49	1.49	1.49	
			TOTAL	8.00	7.16	7.42	5.33	7.42	7.42	
		Private								
			Groundfish	0.80	1.30	1.37	0.83	1.37	1.37	
			Halibut	0.36	0.42	0.45	0.45	0.45	0.45	
			Other	4.72	2.52	2.67	2.67	2.67	2.67	
			TOTAL	5.88	4.24	4.50	3.95	4.50	4.50	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68d continued. Estimated West Coast income impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2004 and 2005, and projected income impacts under the management alternatives (million $)

State	Region	Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
CALIFORNIA										
	North Coast: Humboldt and Del Norte counties									
		Charter								
			Groundfish	0.63	0.16	0.39	0.37	0.39	0.39	
			Other	0.03	0.00	0.00	0.00	0.00	0.00	
			TOTAL	0.66	0.16	0.39	0.37	0.39	0.39	
		Private								
			Groundfish	1.14	2.17	1.60	1.42	1.60	1.60	
			Other	0.47	0.07	0.07	0.07	0.07	0.07	
			TOTAL	1.60	2.24	1.68	1.49	1.68	1.68	
	North-Central Coast: Sonoma and Mendocino counties									
		Charter								
			Groundfish	1.12	0.39	0.70	0.30	0.32	0.76	
			Other	0.89	0.16	0.16	0.16	0.16	0.16	
			TOTAL	2.01	0.55	0.85	0.45	0.48	0.91	
		Private								
			Groundfish	0.94	2.11	1.24	1.02	1.10	1.33	
			Other	0.45	0.24	0.24	0.24	0.24	0.24	
			TOTAL	1.39	2.35	1.48	1.26	1.35	1.58	
	North-Central Coast: San Mateo County up through Marin County									
		Charter								
			Groundfish	3.04	3.33	5.95	2.52	2.75	6.45	
			Other	3.03	1.29	1.29	1.29	1.29	1.29	
			TOTAL	6.07	4.62	7.24	3.81	4.04	7.74	
		Private								
			Groundfish	1.14	1.50	0.88	0.72	0.78	0.95	
			Other	1.19	0.28	0.28	0.28	0.28	0.28	
			TOTAL	2.33	1.78	1.16	1.00	1.07	1.23	
	South-Central Coast: San Luis Obispo County through Santa Cruz County									
		Charter								
			Groundfish	4.32	2.86	6.93	3.12	3.21	8.41	
			Other	1.14	0.16	0.16	0.16	0.16	0.16	
			TOTAL	5.46	3.02	7.09	3.28	3.37	8.58	
		Private								
			Groundfish	1.57	2.29	1.43	1.25	1.28	1.79	
			Other	0.84	0.20	0.20	0.20	0.20	0.20	
			TOTAL	2.41	2.48	1.63	1.44	1.48	1.99	
	South Coast: Ventura and Santa Barbara counties									
		Charter								
			Groundfish	2.88	2.28	2.69	1.76	2.19	2.92	
			Other	4.03	1.16	1.16	1.16	1.16	1.16	
			TOTAL	6.90	3.44	3.85	2.92	3.35	4.08	
		Private								
			Groundfish	0.41	0.43	0.38	0.16	0.25	0.49	
			Other	1.07	0.70	0.70	0.70	0.70	0.70	
			TOTAL	1.48	1.13	1.08	0.86	0.94	1.19	
	South Coast: San Diego County through Los Angeles County									
		Charter								
			Groundfish	8.93	6.74	7.93	5.19	6.47	8.62	
			Other	43.67	19.62	19.62	19.62	19.62	19.62	
			TOTAL	52.60	26.36	27.55	24.81	26.09	28.23	
		Private								
			Groundfish	0.80	1.20	1.06	0.45	0.69	1.38	
			Other	9.20	7.53	7.53	7.53	7.53	7.53	
			TOTAL	10.00	8.73	8.59	7.98	8.22	8.90	
CALIFORNIA TOTALS										
		Charter								
			Groundfish	20.91	15.76	24.58	13.26	15.34	27.54	
			Other	52.78	22.39	22.39	22.39	22.39	22.39	
			TOTAL	73.69	38.14	46.97	35.65	37.72	49.93	
		Private								
			Groundfish	5.98	9.70	6.60	5.02	5.71	7.54	
			Other	13.23	9.02	9.02	9.02	9.02	9.02	
			TOTAL	19.21	18.72	15.62	14.04	14.72	16.56	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68e Summary of total three State Recreational Impacts (trips, expenditures, income) by boat type and trip target.

Summary of total three-state (W-O-C) estimated recreational ocean angler effort (angler trips), expenditures (million $), and income impacts* (million $) by boat type and trip target in 2004 and 2005, and projected under the management alternatives.

Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Effort (angler trips)								
Charter								
	Groundfish	233,899	193,408	274,064	157,363	191,839	301,153	
	Halibut	12,002	11,218	11,470	9,910	10,141	11,162	
	Other	562,420	261,621	261,266	261,260	261,251	261,264	
	TOTAL	808,321	466,247	546,801	428,534	463,232	573,579	
Private								
	Groundfish	195,319	314,162	232,285	167,764	203,186	255,741	
	Halibut	18,122	20,141	20,784	15,653	16,105	19,818	
	Other	616,508	413,200	417,502	417,165	417,267	417,009	
	TOTAL	829,948	747,503	670,571	600,582	636,558	692,567	
Charter+Private								
	Groundfish	429,217	507,570	506,349	325,127	395,025	556,893	
	Halibut	30,124	31,359	32,254	25,563	26,246	30,980	
	Other	1,178,928	674,821	678,768	678,425	678,518	678,273	
	TOTAL	1,638,269	1,213,750	1,217,372	1,029,116	1,099,789	1,266,147	
Angler Expenditures (million $)								
Charter								
	Groundfish	34.34	29.05	40.46	23.56	28.84	44.20	
	Halibut	2.32	2.16	2.20	1.88	1.93	2.14	
	Other	80.82	38.90	38.84	38.84	38.84	38.84	
	TOTAL	117.48	70.11	81.50	64.28	69.61	85.18	
Private								
	Groundfish	9.19	14.84	11.01	7.96	9.68	12.07	
	Halibut	0.88	0.99	1.02	0.79	0.81	0.98	
	Other	28.80	19.12	19.34	19.33	19.33	19.32	
	TOTAL	38.88	34.94	31.37	28.07	29.82	32.37	
Charter+Private								
	Groundfish	43.53	43.89	51.47	31.51	38.52	56.28	
	Halibut	3.21	3.14	3.22	2.67	2.74	3.11	
	Other	109.62	58.02	58.18	58.17	58.17	58.16	
	TOTAL	156.36	105.05	112.87	92.35	99.43	117.55	
Income Impacts (million $)								
Charter								
	Groundfish	27.34	23.25	32.35	18.88	23.05	35.28	
	Halibut	1.99	1.84	1.87	1.59	1.63	1.82	
	Other	63.85	31.12	31.07	31.07	31.07	31.07	
	TOTAL	93.18	56.20	65.29	51.54	55.75	68.17	
Private								
	Groundfish	7.10	11.48	8.45	6.14	7.43	9.30	
	Halibut	0.63	0.70	0.73	0.56	0.58	0.69	
	Other	21.65	14.38	14.54	14.53	14.53	14.52	
	TOTAL	29.38	26.56	23.72	21.23	22.53	24.51	
Charter+Private								
	Groundfish	34.44	34.72	40.80	25.02	30.48	44.58	
	Halibut	2.62	2.54	2.60	2.15	2.21	2.51	
	Other	85.50	45.50	45.61	45.60	45.60	45.59	
	TOTAL	122.56	82.76	89.01	72.76	78.29	92.68	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68f Combined recreational and income impacts by region and alternative and
7.68g Change in combined recreational and commercial impacts by region and alternative

Table 7-68f Summary of estimated income impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (million $).

Region	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	15.40	13.37	14.89	14.96	
North Washington Coast	16.62	15.02	15.45	15.83	
South & Central WA Coast	121.08	110.10	114.58	120.04	
Astoria-Tillamook	97.22	89.10	96.20	97.88	
Newport	49.70	39.35	45.45	48.88	
Coos Bay	32.39	29.29	32.12	32.44	
Brookings	17.72	16.21	17.50	17.57	
Crescent City-Eureka	19.40	16.34	19.32	19.73	
Fort Bragg	11.32	8.88	10.93	11.65	
Bodega Bay - San Francisco	43.69	39.51	40.37	44.27	
Monterey - Morro Bay	37.72	32.39	33.69	39.59	
Santa Barbara	62.58	61.34	61.92	62.90	
Los Angeles - San Diego	144.15	140.47	142.21	145.05	
TOTAL	669.01	611.38	644.62	670.80	

Table 7-68g Change (from No Action) in estimated income impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (million $).

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	*15.4*	-2.0	-0.5	-0.4	
North Washington Coast	*16.6*	-1.6	-1.2	-0.8	
South & Central WA Coast	*121.1*	-11.0	-6.5	-1.0	
Astoria-Tillamook	*97.2*	-8.1	-1.0	0.7	
Newport	*49.7*	-10.4	-4.3	-0.8	
Coos Bay	*32.4*	-3.1	-0.3	0.0	
Brookings	*17.7*	-1.5	-0.2	-0.2	
Crescent City-Eureka	*19.4*	-3.1	-0.1	0.3	
Fort Bragg	*11.3*	-2.4	-0.4	0.3	
Bodega Bay - San Francisco	*43.7*	-4.2	-3.3	0.6	
Monterey - Morro Bay	*37.7*	-5.3	-4.0	1.9	
Santa Barbara	*62.6*	-1.2	-0.7	0.3	
Los Angeles - San Diego	*144.2*	-3.7	-1.9	0.9	
TOTAL	*669.01*	-57.63	-24.39	1.78	

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Table 7-58h Combined recreational and commercial employment impacts by region and alternative and Table 7-59i Change in combined recreational and commercial employment impacts by region and alternative

Table 7-68h Summary of estimated employment impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (number of jobs).

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	*692*	601	669	672	
North Washington Coast	*747*	675	694	711	
South & Central WA Coast	*5,442*	4,948	5,149	5,395	
Astoria-Tillamook	*4,365*	4,000	4,319	4,395	
Newport	*2,231*	1,767	2,040	2,194	
Coos Bay	*1,454*	1,315	1,442	1,456	
Brookings	*796*	728	786	789	
Crescent City-Eureka	*770*	649	767	783	
Fort Bragg	*449*	353	434	463	
Bodega Bay - San Francisco	*1,735*	1,569	1,603	1,757	
Monterey - Morro Bay	*1,431*	1,242	1,290	1,496	
Santa Barbara	*2,171*	2,128	2,148	2,182	
Los Angeles - San Diego	*5,000*	4,872	4,933	5,031	
TOTAL	*27,283*	24,847	26,275	27,325	

Table 7-68i. Change (from No Action) in estimated employment impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (number of jobs).

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	*692*	-91	-23	-20	
North Washington Coast	*747*	-72	-53	-36	
South & Central WA Coast	*5,442*	-494	-292	-47	
Astoria-Tillamook	*4,365*	-365	-46	30	
Newport	*2,231*	-465	-191	-37	
Coos Bay	*1,454*	-139	-12	2	
Brookings	*796*	-68	-10	-7	
Crescent City-Eureka	*770*	-122	-3	13	
Fort Bragg	*449*	-97	-15	13	
Bodega Bay - San Francisco	*1,735*	-166	-132	23	
Monterey - Morro Bay	*1,431*	-189	-140	65	
Santa Barbara	*2,171*	-43	-23	11	
Los Angeles - San Diego	*5,000*	-128	-67	31	
TOTAL	*27,283*	-2,437	-1,009	42	

Table 7.69 Exvessel Value and Number of Angler Trips Lost under Zero Harvest of Rebuilding Species Alternatives

		Darkblotched and POP	Canary and Yelloweye	Bocaccio and Cowcod	Widow	All Overfished Species	Total 2005
Major Sector	Sub sector or area-based stratification	Lost Revenue	Lost Revenue	Lost Revenue	Lost Revenue	Lost Revenue	Lost Revenue
Groundfish Bottom Trawl	Coastwide Groundfish Bottom trawl					22,297,476	22,297,476
	Slope bottom trawl coastwide						
	Slope bottom trawl N 38	14,315,600					
	Shelf bottom trawl coastwide				6,911,000		
	Shelf bottom trawl N 36		6,511,000				
	Shelf bottom trawl S 40 10			2,648,300			
Whiting non-tribal	Coastwide Non-tribal Whiting	27,116,070	27,116,070		27,116,070	27,116,070	27,116,070
Non-tribal Fixed Gear	Coastwide Non-tribal Fixed gear					19,475,005	19,475,005
	Sablefish N CP	11,656,796	11,656,796				
	Sable S 40 10			2,051,515			
	Non-Sablefish FG Offshore N CP		545,341				
	Non-Sablefish FG Offshore N 40 10	436,698			436,698		
	Non-Sablefish FG Offshore S 40 10			1,464,944			
	Nearshore Coastwide		2,706,502				
	Nearshore N 40 10				1,379,012		
	Nearshore S 40 10						
Non-Groundfish Trawl	Coastwide non-gfish trawl			3,299,717		3,299,717	3,299,717
	CA Halibut		2,839,900	2,839,900		2,839,900	
	Other bottom Trawl			459,817		459,817	
Coastal Pelagic S 40 10				36,474,379		36,474,379	36,474,379
Shrimp and Prawn Trawl	Shrimp and prawn trawl coastwide					10,745,489	10,745,489
	Pink Shrimp coastwide	10,410,400	10,410,400		10,410,400	10,410,400	
	Pink Shrimp S 40 10			227,300			
	Prawn Trawl			335,089		335,089	
Salmon Troll	Salmon Troll Coastwide		24,032,949		24,032,949	24,032,949	24,032,949
	Salmon Troll S 40 10			1,086,424			
Tribal Fisheries	Tribal groundfish and salmon		10,185,700			10,185,700	10,185,700
	Tribal bottom trawl	693,379	693,379			693,379	
	Tribal sablefish		3,340,263			3,340,263	
	Tribal midwater		662,488		662,488	662,488	
	Tribal salmon troll		1,400,000			1,400,000	
	Tribal whiting		4,089,570			4,089,570	
Recreational Fisheries (trips)	California ground/misc/samn		831,966	741,569	831,966	831,966	831,966
	recreational groundfish California		407,472		407,472	407,472	
	recreational south 40 10 only			349,046			
	recreational misc California						

		Darkblotched and POP	Canary and Yelloweye	Bocaccio and Cowcod	Widow	All Overfished Species	Total 2005
			392,523		392,523	392,523	
	recreational south 40 10 only			392,523			
	recreational salmon California		31,971		31,971	31,971	
	recreational south 40 10 only			30,605			
	Oregon ground/hal/samn/misc		165,025		165,025	165,025	165,025
	recreational groundfish OR		75,337		75,337	75,337	
	recreational halibut OR		16,871		16,871	16,871	
	recreational salmon OR		61,853		61,853	61,853	
	recreational combined/misc OR		10,964		10,964	10,964	
	Washington ground/hal/samn/misc		152,527			152,527	152,527
	recreational groundfish WA		28,671			28,671	
	recreational halibut WA		15,383			15,383	
	recreational combined/misc WA		905			905	
	recreational salmon WA		107,568			107,568	
	Exvessel value loss	64,628,943	106,190,358	50,887,385	70,948,617	177,857,691	
	Angler trip loss		1,149,518	741,569	996,991	1,149,518	

Commercial Impacts

Table below shows the percentage change in estimated commercial fishery income impacts by port group compared to the No Action Alternative for shoreside landings.

Table 7-70. Summary of percentage change in estimated commercial fishery income impacts by port group compared to No Action Alternative (shoreside landings only).

	No Action (2006)		Alt 1		Alt 2		Alt 3	
	Shoreside commercial fishery income impacts generated by:							
Port Group Area	*All Council-managed fisheries*	*Groundfish fisheries*	All Council-managed fisheries	Groundfish fisheries	All Council-managed fisheries	Groundfish fisheries	All Council-managed fisheries	Groundfish fisheries
Puget Sound	*15.4*	*7.3*	-13.0%	-27.4%	-3.2%	-6.8%	-2.6%	-5.5%
North Washington Coast	*14.3*	*6.7*	-6.3%	-13.4%	-4.2%	-9.0%	-4.2%	-9.0%
South and Central Washington Coast	*108.9*	*27.6*	-10.0%	-39.9%	-6.0%	-23.6%	-0.9%	-4.0%
Unidentified Washington	*9.5*	*0.7*	-2.1%	-14.3%	-2.1%	-14.3%	-2.1%	-14.3%
Astoria-Tillamook	*94.6*	*18.8*	-8.1%	-41.0%	-1.1%	-5.3%	0.7%	3.7%
Newport	*44.5*	*20.7*	-20.2%	-43.5%	-9.7%	-20.8%	-2.0%	-3.9%
Coos Bay	*30.2*	*7.8*	-9.3%	-35.9%	-1.0%	-3.8%	0.0%	0.0%
Brookings	*15.9*	*3.6*	-6.3%	-27.8%	-1.9%	-5.6%	-1.3%	-2.8%
Crescent City	*7.1*	*2.1*	-8.5%	-28.6%	1.4%	4.8%	1.4%	4.8%
Eureka	*10.2*	*6.2*	-21.6%	-35.5%	-1.0%	-1.6%	2.9%	3.2%
Fort Bragg	*9*	*5.4*	-20.0%	-33.3%	1.1%	1.9%	2.2%	3.7%
Bodega Bay-San Francisco	*35.3*	*2.1*	-1.7%	-28.6%	0.0%	0.0%	0.0%	0.0%
Monterey	*24.4*	*3.1*	-2.9%	-22.6%	-0.4%	-3.2%	0.0%	0.0%
Morro Bay	*4.6*	*2.3*	-13.0%	-26.1%	-2.2%	-4.3%	0.0%	4.3%
Santa Barbara	*57.7*	*0.6*	-0.2%	-16.7%	-0.3%	-16.7%	-0.2%	0.0%
Los Angeles	*99.6*	*1.2*	-0.2%	-16.7%	0.0%	0.0%	0.0%	0.0%
San Diego	*8.4*	*0.6*	-2.4%	-16.7%	-1.2%	0.0%	-1.2%	0.0%

Table 7-71. Summary of percentage change in estimated recreational income impacts by region compared to No Action Alternative.

State	Region	Boat Type	*No Action*	Alt 1	Alt 2	Alt 3
WASHINGTON						
	North Washington Coast					
		Charter				
		Groundfish	*0.12*	-50.0%	-41.7%	-16.7%
		TOTAL	*1.04*	-32.7%	-27.9%	-7.7%
		Private				
		Groundfish	*0.41*	-46.3%	-31.7%	-24.4%
		TOTAL	*1.32*	-27.3%	-22.0%	-11.4%
	South & Central WA Coast					
		Charter				
		Groundfish	*2.37*	0.0%	0.0%	0.0%
		TOTAL	*9.86*	0.0%	0.0%	0.0%
		Private				
		Groundfish	*0.07*	0.0%	0.0%	0.0%
		TOTAL	*2.28*	0.0%	0.0%	0.0%
OREGON						
	Astoria-Tillamook					
		Charter				
		Groundfish	*0.75*	-40.0%	0.0%	0.0%
		TOTAL	*1.45*	-20.7%	0.0%	0.0%
		Private				
		Groundfish	*0.24*	-37.5%	0.0%	0.0%
		TOTAL	*1.16*	-8.6%	0.0%	0.0%
	Newport					
		Charter				
		Groundfish	*3.25*	-39.7%	0.0%	0.0%
		TOTAL	*4.22*	-30.6%	0.0%	0.0%
		Private				
		Groundfish	*0.28*	-39.3%	0.0%	0.0%
		TOTAL	*1.03*	-10.7%	0.0%	0.0%
	Coos Bay					
		Charter				
		Groundfish	*0.61*	-39.3%	0.0%	0.0%
		TOTAL	*1.03*	-23.3%	0.0%	0.0%
		Private				
		Groundfish	*0.21*	-38.1%	0.0%	0.0%
		TOTAL	*1.17*	-6.8%	0.0%	0.0%
	Brookings					
		Charter				
		Groundfish	*0.67*	-40.3%	0.0%	0.0%
		TOTAL	*0.72*	-36.1%	0.0%	0.0%
		Private				
		Groundfish	*0.64*	-39.1%	0.0%	0.0%
		TOTAL	*1.13*	-22.1%	0.0%	0.0%
CALIFORNIA						
	North Coast: Humboldt and Del Norte counties					
		Charter				
		Groundfish	*0.39*	-5.1%	0.0%	0.0%
		TOTAL	*0.39*	-5.1%	0.0%	0.0%
		Private				

	Groundfish	*1.6*	-11.3%	0.0%	0.0%
	TOTAL	*1.68*	-11.3%	0.0%	0.0%
North-Central Coast: Sonoma and Mendocino counties					
	Charter				
	Groundfish	*0.7*	-57.1%	-54.3%	8.6%
	TOTAL	*0.85*	-47.1%	-43.5%	7.1%
	Private				
	Groundfish	*1.24*	-17.7%	-11.3%	7.3%
	TOTAL	*1.48*	-14.9%	-8.8%	6.8%
North-Central Coast: San Mateo up through Marin County					
	Charter				
	Groundfish	*5.95*	-57.6%	-53.8%	8.4%
	TOTAL	*7.24*	-47.4%	-44.2%	6.9%
	Private				
	Groundfish	*0.88*	-18.2%	-11.4%	8.0%
	TOTAL	*1.16*	-13.8%	-7.8%	6.0%
South-Central Coast: San Luis Obispo County through Santa Cruz					
	Charter				
	Groundfish	*6.93*	-55.0%	-53.7%	21.4%
	TOTAL	*7.09*	-53.7%	-52.5%	21.0%
	Private				
	Groundfish	*1.43*	-12.6%	-10.5%	25.2%
	TOTAL	*1.63*	-11.7%	-9.2%	22.1%
South Coast: Ventura and Santa Barbara counties					
	Charter				
	Groundfish	*2.69*	-34.6%	-18.6%	8.6%
	TOTAL	*3.85*	-24.2%	-13.0%	6.0%
	Private				
	Groundfish	*0.38*	-57.9%	-34.2%	28.9%
	TOTAL	*1.08*	-20.4%	-13.0%	10.2%
South Coast: San Diego County through Los Angeles County					
	Charter				
	Groundfish	*7.93*	-34.6%	-18.4%	8.7%
	TOTAL	*27.55*	-9.9%	-5.3%	2.5%
	Private				
	Groundfish	*1.06*	-57.5%	-34.9%	30.2%
	TOTAL	*8.59*	-7.1%	-4.3%	3.6%

Agenda Item F.2.a
Attachment 3
June 2006

DRAFT

Amendment 16-4
(Overfished Species Rebuilding Reprise)

PACIFIC COAST GROUNDFISH FISHERY MANAGEMENT PLAN

FOR THE CALIFORNIA, OREGON, AND WASHINGTON GROUNDFISH FISHERY

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Changes to the FMP Since the Version Published in July 1993

The last generally available version of the Groundfish FMP was produced in July 1993 and incorporated changes made through Amendment 7. In addition to adding material required by the 1996 Sustainable Fisheries Act, Amendment 11 included a general editorial clean-up of Chapters 1–6. However, a revised version of the full document was never produced. Major changes to the content and organization of the FMP, since Amendment 7 and aside from the overall revisions of Chapters 1–6 made by Amendment 11, are summarized here to help clarify references to parts of the FMP in other Council documents.

Chapters in July 1993 FMP	Changes Made Through the Current Version of the FMP
Chapter 1 Introduction	No changes since Amendment 11
Chapter 2 Goals and Objectives	Amendments and additions, no substantial change in organization. (Amendments 12, 13, 16-1, and 17.)
Chapter 3 Areas and Stocks Involved	Amendments and additions, no substantial change in organization. (Amendment 16-1.)
Chapter 4 Optimum Yield	Substantially changed and expanded by Amendment 16-1, which moved and revised material on determining ABC, OY, precautionary thresholds, and rebuilding overfished species that was in Chapter 5 into this chapter. Amendments 16-2 and 16-3 add rebuilding plan summaries to section 4.5.4
Chapter 5 Specification and Apportionment of Harvest Levels	Substantially changed by Amendment 16-1, which moved material to Chapter 4, as noted above. Discussion of DAH, DAP, JVP, and TALFF deleted. (Also Amendments 12, 13, and 17.)
Chapter 6 Management Measures	Amendments and additions, no substantial change in organization. (Amendments 10, 11, 13, 16-1, 17.)
Chapter 7 Experimental Fisheries	No Changes
Chapter 8 Scientific Research	No Changes
Chapter 9 Restrictions on Other Fisheries	No Changes
Chapter 10 Procedures for Reviewing State Regulations	No Changes
Chapter 11 Appendices	This material is now produced under separate cover. An unnumbered section at the end of the FMP, “Appendices Contents,” summarizes the topic areas in the Appendices. It is intended that the unnumbered sections (also References, see below) will always appear at the end of the document. (Amendment 11 added material on essential fish habitat.)
Chapter 12 Management Measures that Continue	This chapter is renumbered Chapter 11. No other

in Effect With Implementation of Amendment 4	changes have been made.
Chapter 13 References	This chapter has been moved to an unnumbered section at the end of the document. (Amendment 16-1.)
Chapter 14 Groundfish Limited Entry	This chapter is renumbered Chapter 12. (Amendments 13 and 14.)

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LIST OF ACRONYMS AND ABBREVIATIONS

ABC	acceptable biological catch
DAH	domestic annual harvest
DAP	domestic annual processing
EEZ	exclusive economic zone
EFH	essential fish habitat
EFP	experimental fishing permit
ESA	Endangered Species Act
MARPOL	International Convention for the Prevention of Pollution from Ships
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
FMP	fishery management plan
GAP	Groundfish Advisory Subpanel
GMT	Groundfish Management Team
HG	harvest guideline
IFQ	individual fishing quota
INPFC	International North Pacific Fisheries Commission
JV	joint-venture
JVP	joint-venture processing
LE	limited entry
MLR	minimum landing requirement
mt	metric ton
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
OY	optimum yield
POP	Pacific ocean perch
PRA	Paperwork Reduction Act
PSMFC	Pacific States Marine Fisheries Commission
Regional Director	Regional Director, National Marine Fisheries Service
SAFE	Stock Assessment and Fishery Evaluation
Secretary	U.S. Secretary of Commerce
SPR	spawning biomass per recruit
SSC	Scientific and Statistical Committee
TALFF	total allowable level of foreign fishing

<u>A note on annotations</u>: Amended parts of the FMP are denoted at the end of chapters or second-level

sections by amendment number. If applicable, changes to lower-level subsections are also noted at the end of second-level sections. Amendments subsequent to Amendment 4, which substantially revised the original FMP are so noted.

1.0 INTRODUCTION

1.1 Evolution of the Management Plan

The Pacific Coast Groundfish Fishery Management Plan (FMP) was approved by the U.S. Secretary of Commerce (Secretary) on January 4, 1982, and implemented on October 5, 1982. Prior to implementation of the FMP, management of domestic groundfish fisheries was under the jurisdiction of the states of Washington, Oregon, and California. State regulations have been in effect on the domestic fishery for more than 100 years with each state acting independently in both management and enforcement. Furthermore, many fisheries overlapped state boundaries and participants often operated in more than one state. Management and a lack of uniformity of regulations had become a difficult problem, which stimulated the formation of the Pacific States Marine Fisheries Commission (PSMFC) in 1947. PSMFC had no regulatory power but acted as a coordinating entity with authority to submit specific recommendations to states for their adoption. The 1977 Fishery Conservation and Management Act (later amended and renamed the Magnuson-Stevens Fishery Conservation and Management Act (or Magnuson-Stevens Act,) established eight regional fishery management Councils, including the Pacific Council. Between 1977 and the implementation of the groundfish FMP in 1982, state agencies worked with the Council to address conservation issues. Specifically, in 1981, managers proposed a rebuilding program for Pacific ocean perch. To implement this program, the states of Oregon and Washington established landing limits for Pacific ocean perch in the Vancouver and Columbia management areas.

Management of foreign fishing operations began in February 1967 when the U.S. and U.S.S.R. signed the first bilateral fishery agreement affecting trawl fisheries off Washington, Oregon, and California. The U.S. later signed bilateral agreements with Japan and Poland for fishing off the U.S. West Coast. Each of these agreements was renegotiated to reduce the impact of foreign fishing on important West Coast stocks, primarily rockfish, Pacific whiting, and sablefish. When the U.S. extended its jurisdiction to 200 miles (upon signing the Fishery Conservation and Management Act of 1976), the National Marine Fisheries Service (NMFS) developed and the Secretary implemented the preliminary management plan for the foreign trawl fishery off the Pacific Coast. From 1977 to 1982, the foreign fishery was managed under that plan. Many of these regulations were incorporated into the FMP, which provided for continued management of the foreign fishery.

Joint-venture fishing, where domestic vessels caught the fish to be processed aboard foreign vessels, began in 1979 and by 1989 had entirely supplanted directed foreign fishing. These joint ventures primarily targeted Pacific whiting. Joint-venture fisheries were then rapidly replaced by wholly domestic processing; by 1991 foreign participation had ended and U.S.-flagged motherships, catcher-processors, and shore-based vessels had taken over the Pacific whiting fishery. Since then U.S. fishing vessels and seafood processors have fully utilized Pacific Coast fishery resources. Although the Council may entertain applications for foreign or joint venture fishing or processing at any time, provisions for these activities have been removed from the FMP. Re-establishing such opportunities would require another FMP amendment.

Since it was first implemented in 1982, the Council has amended the groundfish FMP 20 times in response to changes in the fishery, reauthorizations of the Magnuson-Stevens Act, and litigation that invalidated provisions incorporated by earlier amendments. During the first ten years of plan implementation, up to 1992, the Secretary approved six amendments. Amendment 4, approved in 1990, was the most significant early amendment; in addition to a comprehensive update and reorganization of the FMP, it established additional framework procedures for establishing and modifying management measures. Another important change was implemented in 1992 with Amendment 6, which established a license limitation (limited entry) program intended to address overcapitalization by restricting further participation in groundfish trawl, longline, and trap fisheries.

The next decade, through 2002, saw the approval of another seven amendments. Amendment 9 modified the limited entry program by establishing a sablefish endorsement for longline and pot permits. Amendments 11, 12, 13 were responses to changes in the Magnuson-Stevens Act due to the 1996 Sustainable Fisheries Act. These changes required FMPs to identify essential fish habitat (EFH), more actively reduce bycatch and bycatch mortality, and strengthen conservation measures to both prevent fish stocks from becoming overfished~~,~~ and promote rebuilding of any stocks that had become overfished. Amendment 14, implemented in 2001, built on Amendment 9 to further refine the limited entry permit system for the economically important fixed gear sablefish fishery. It allowed a vessel owner to "stack" up to three limited entry permits on one vessel along with associated sablefish catch limits. This in effect established a limited tradable quota system for participants in the primary sablefish fishery.

Most of the amendments adopted since 2001 deal with legal challenges to the three SFA-related amendments mentioned above, which were remanded in part by the Federal Court. These have required new amendments dealing with overfishing, bycatch monitoring and mitigation, and essential fish habitat. In relation to the first of these three issues, the Magnuson-Stevens Act now requires FMPs to identify thresholds for both the fishing mortality rate constituting overfishing and the stock size below which a stock is considered overfished. Once the Secretary determines a stock is overfished, the Council must develop and implement a plan to rebuild it to a healthy level. Since these thresholds were established for Pacific Coast groundfish, nine stocks have been declared overfished. The Court found that the rebuilding plan framework adopted by Amendment 12 did not comply with the Magnuson-Stevens Act. In response, Amendments 16-1, 16-2, and 16-3 established the current regime for managing these overfished species.[1] Amendment 16-1, approved in 2003, incorporated guidelines for developing and adopting rebuilding plans and substantially revised Chapters 4 and 5. Amendments 16-2 and 16-3, approved in 2004, incorporated key elements of rebuilding plans into Section 4.5.4. In 2005, a Court of Appeals ruling refined court interpretation of the Magnuson-Stevens Act rebuilding period requirements. Amendment 16-4, approved in [2006], revised the FMP to specify that rebuilding periods will be as short as possible, taking into account the status and biology of the stocks, the needs of fishing communities, and interactions of overfished stocks with the marine

[1] Although the Secretary declared Pacific whiting overfished in 2002, a 2004 stock assessment found that it had recovered to its rebuilt level. Thus, a rebuilding plan for this species was not adopted by these amendments.

ecosystem. As a result of this ruling, Amendment 16-4 also revised the rebuilding periods for [list stocks].

Amendment 17 modified the periodic process the Council uses to establish and modify harvest specifications and management measures for the groundfish fishery. Although not an SFA-related issue, this change did solve a procedural problem raised in litigation. The Council now establishes specifications and management measures every two years, allowing more time for them to be developed during the Council's public meetings.

Amendment 18, approved in 2006, addresses a remand of elements in Amendment 11 related to bycatch monitoring and mitigation. It incorporates a description of the Council's bycatch-related policies and programs into Chapter 6. It also effected a substantial reorganization and update of the FMP, so that it better reflects the Council's and the NMFS's evolving framework approach to management. Under this framework, the Council may recommend a range of broadly defined management measures for NMFS to implement. In addition to the range of measures, this FMP specifies the procedures the Council and NMFS must follow to establish and modify these measures. When first implemented, the FMP specified a relatively narrow range of measures, which were difficult to modify in response to changes in the fishery. The current framework allows the Council to effectively respond when faced with the dynamic challenges posed by the current groundfish fishery.

Amendment 19, also approved in 2006, revises the definition of groundfish EFH, identified habitat areas of particular concern, and describes management measures intended to mitigate the adverse effects of fishing on EFH. This amendment supplants the definition of EFH added to the FMP by Amendment 11.

1.2 How This Document is Organized

The groundfish FMP is organized into 11 chapters

Chapter 1 (this chapter) describes the development of the FMP and how it is organized.

Chapter 2 describes the goals and objectives of the plan and defines key terms and concepts.

Chapter 3 specifies the geographic area covered by this plan and lists the species managed by it, referred to as the fishery management unit, or FMU.

Chapter 4 describes how the Council determines harvest levels. These harvest limits are related to the maximum sustainable yield (MSY) and allowable biological catch (ABC) for FMU species. Precautionary reductions from these thresholds may be applied, depending on the management status of a given stock. If, according to these thresholds, a stock is determined to be overfished, the Council must recommend measures to end overfishing and develop a rebuilding plan, as specified in this chapter. Based on the thresholds, criteria and procedures described in this chapter, the Council specifies an optimum yield (OY), or harvest limit, for managed stocks or stock complexes.

Chapter 5 describes how the Council periodically specifies harvest levels and the management measures needed to prevent catches from exceeding those levels. Currently, the Council develops these specifications over the course of three meetings preceding the start of a two-year management period. (Separate OYs are specified for each of the two years in this period.) This chapter also describes how the stock assessment/fishery evaluation (SAFE) document, which provides information important to management, is developed.

Chapter 6 describes the management measures used by the Council to meet the objectives of the Magnuson-Stevens Act and this FMP. As noted above, this FMP is a framework plan; therefore, the range of management measures is described in general terms while the processes necessary to establish or modify different types of management measures are detailed. Included in the description of management measures is the Council's program for monitoring total catch (which includes bycatch) and minimizing bycatch.

Chapter 7 identifies EFH for groundfish FMU species and the types of measures that may be used to mitigate adverse impacts to essential fish habitat from fishing.

Chapter 8 describes procedures followed by the Council to evaluate and recommend issuing exempted fishing permits (EFPs). Permitted vessels are authorized, for limited experimental purposes, to harvest groundfish by means or in amounts that would otherwise be prohibited by this FMP and its implementing regulations. These permits allow experimentation in support of FMP goals and objectives. EFPs have been used, for example, to test gear types that result in less bycatch.

Chapter 9 provides criteria for determining what activities involving groundfish would qualify as scientific research and could therefore qualify for special treatment under the management program.

Chapter 10 describes the procedures used to review state regulations in order to ensure that they are consistent with this FMP and its implementing regulations.

Chapter 11 describes the groundfish limited entry program.

Appendix A contains descriptions of the biological, economic, social, and regulatory characteristics of the groundfish fishery.

Appendix B contains detailed information on groundfish EFH.

Appendix C describes the effects of fishing on groundfish EFH.

Appendix D describes the effects of activities other than fishing on groundfish EFH.

The appendices contain supporting information for the management program. Because these appendices do not describe the management framework or Council groundfish management policies and procedures, and only supplement the required and discretionary provisions of the FMP described in §303 of the Magnuson-Stevens Act, they may be periodically updated without being subjected to the Secretarial review and approval process described in §304(a) of the Magnuson-Stevens Act. These appendices are published under separate cover.

[Amended: 11, 16-4, 18,19]

2.0 GOALS AND OBJECTIVES

2.1 Goals and Objectives for Managing the Pacific Coast Groundfish Fishery

The Council is committed to developing long-range plans for managing the Washington, Oregon, and California groundfish fisheries that will promote a stable planning environment for the seafood industry, including marine recreation interests, and will maintain the health of the resource and environment. In developing allocation and harvesting systems, the Council will give consideration to maximizing economic benefits to the United States, consistent with resource stewardship responsibilities for the continuing welfare of the living marine resources. Thus, management must be flexible enough to meet changing social and economic needs of the fishery as well as to address fluctuations in the marine resources supporting the fishery. The following goals have been established in order of priority for managing the West Coast groundfish fisheries, to be considered in conjunction with the national standards of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

Management Goals.

> Goal 1 - Conservation. Prevent overfishing and rebuild overfished stocks by managing for appropriate harvest levels and prevent, to the extent practicable, any net loss of the habitat of living marine resources.
>
> Goal 2 - Economics. Maximize the value of the groundfish resource as a whole
>
> Goal 3 - Utilization. Within the constraints of overfished species rebuilding requirements, achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

Objectives.

To accomplish these management goals, a number of objectives will be considered and followed as closely as practicable:

Conservation.

> Objective 1. Maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.
>
> Objective 2. Adopt harvest specifications and management measures consistent with resource stewardship responsibilities for each groundfish species or species group. Achieve a level of harvest capacity in the fishery that is appropriate for a sustainable harvest and low discard rates, and which results in a fishery that is diverse, stable, and profitable. This reduced capacity should lead to more effective management for many other fishery problems.
>
> Objective 3. For species or species groups that are overfished, develop a plan to rebuild the stock as soon as possible, taking into account the status and biology of the stock, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem. ~~required by the Magnuson-Stevens Act.~~

Objective 4. Where conservation problems have been identified for nongroundfish species and the best scientific information shows that the groundfish fishery has a direct impact on the ability of that species to maintain its long-term reproductive health, the Council may consider establishing management measures to control the impacts of groundfish fishing on those species. Management measures may be imposed on the groundfish fishery to reduce fishing mortality of a nongroundfish species for documented conservation reasons. The action will be designed to minimize disruption of the groundfish fishery, in so far as consistent with the goal to minimize the bycatch of nongroundfish species, and will not preclude achievement of a quota, harvest guideline, or allocation of groundfish, if any, unless such action is required by other applicable law.

Objective 5. Describe and identify essential fish habitat (EFH), adverse impacts on EFH, and other actions to conserve and enhance EFH, and adopt management measures that minimize, to the extent practicable, adverse impacts from fishing on EFH.

Economics.

Objective 6. Within the constraints of the conservation goals and objectives of the FMP, a~~A~~ttempt to achieve the greatest possible net economic benefit to the nation from the managed fisheries.

Objective 7. Identify those sectors of the groundfish fishery for which it is beneficial to promote year-round marketing opportunities and establish management policies that extend those sectors fishing and marketing opportunities as long as practicable during the fishing year.

Objective 8. Gear restrictions to minimize the necessity for other management measures will be used whenever practicable. Encourage development of practicable gear restrictions intended to reduce regulatory and/or economic discards through gear research regulated by exempted fishing permits.

Utilization.

Objective 9. Develop management measures and policies that foster and encourage full utilization (harvest and processing), in accordance with conservation goals, of the Pacific Coast groundfish resources by domestic fisheries.

Objective 10. Recognize~~ing~~ the multispecies nature of the fishery and establish a concept of managing by species and gear or by groups of interrelated species.

Objective 11. Develop management programs that reduce regulations-induced discard and/or which reduce economic incentives to discard fish. Develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. Promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve other information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

Social Factors.

Objective 12. When conservation actions are necessary to protect a stock or stock assemblage, attempt to develop management measures that will affect users equitably.

Objective 13. Minimize gear conflicts among resource users.

Objective 14. When considering alternative management measures to resolve an issue, choose the measure that best accomplishes the change with the least disruption of current domestic fishing practices, marketing procedures, and the environment.

Objective 15. Avoid unnecessary adverse impacts on small entities.

Objective 16. Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.

Objective 17. Promote the safety of human life at sea.

[Amended; 7, 11, 13, 16-1, 16-4, 18]

2.2 Operational Definition of Terms

Acceptable Biological Catch (ABC) is a biologically based estimate of the amount of fish that may be harvested from the fishery each year without jeopardizing the resource. It is a seasonally determined catch that may differ from MSY for biological reasons. It may be lower or higher than MSY in some years for species with fluctuating recruitment. The ABC may be modified to incorporate biological safety factors and risk assessment due to uncertainty. Lacking other biological justification, the ABC is defined as the MSY exploitation rate multiplied by the exploitable biomass for the relevant time period.

Biennial fishing period is defined as a 24-month period beginning January 1 and ending December 31.

Bottom (or flatfish bottom) trawl is a trawl in which the otter boards or the footrope of the net are in contact with the seabed. It includes roller (or bobbin) trawls, Danish and Scottish seine gear, and pair trawls fished on the bottom.

Bottom-contact gear types by design and through normal use make contact with the sea floor. Such contact is more than intermittent in duration and areal extent.

Bycatch means fish which are harvested in a fishery, but which are not sold or kept for personal use and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch and release fishery management program.

Chafing gear is webbing or other material attached to the codend of a trawl net to protect the codend from wear.

Charter fishing means fishing from a vessel carrying a passenger for hire (as defined in section 2101(21a) of title 46, United States Code) who is engaged in recreational fishing.

Closure, when referring to closure of a fishery, means that taking and retaining, possessing or landing the particular species or species complex is prohibited.

Council means the Pacific Fishery Management Council, including its Groundfish Management Team (GMT), Scientific and Statistical Committee (SSC), Groundfish Advisory Subpanel (GAP), and any other committee established by the Council.

Commercial fishing is (1) fishing by a person who possesses a commercial fishing license or is required by law to possess such license issued by one of the states or the federal government as a prerequisite to taking, landing, and/or sale; or (2) fishing which results in or can be reasonably expected to result in sale, barter, trade, or other disposition of fish for other than personal consumption.

Density dependence is the degree to which recruitment declines as spawning biomass declines. Typically we assume that a Beverton-Holt form is appropriate and that the level of density-dependence is such that the recruitment only declines by ten percent when the spawning biomass declines by 50%.

Double-walled codend is a codend constructed of two walls of webbing.

$F_{x\%}$ is the rate of fishing mortality that will reduce female spawning biomass per recruit to x percent of its unfished level. $F_{100\%}$ is zero, and $F_{35\%}$ is a reasonable proxy for F_{MSY}.

Economic discards means fish which are the target of a fishery, but which are not retained because they are of an undesirable size, sex, quality, or for other economic reasons.

Essential fish habitat means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

Exploitable biomass is the biomass that is available to a unit of fishing effort. Defined as the sum of the population biomass at age (calculated as the mean within the fishing year) multiplied by the age-specific availability to the fishery. Exploitable biomass is equivalent to the catch biomass divided by the instantaneous fishing mortality rate.

F is the instantaneous rate of fishing mortality. F typically varies with age, so the F values are presented for the age with maximum F. Fish of other ages have less availability to the fishery, so a unit of effort applies a lower relative level of fishing mortality to these fish.

F_{MSY} is the fishing mortality rate that maximizes catch biomass in the long term.

$F_{0.1}$ is the fishing mortality rate at which a change in fishing mortality rate will produce a change in yield per recruit that is ten percent of the slope of the yield curve at nil levels of fishing mortality.

F_{OF} is the rate of fishing mortality defined as overfishing.

Fishing means (1) the catching, taking, or harvesting of fish; (2) the attempted catching, taking, or harvesting of fish; (3) any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or (4) any operations at sea in support of, or in preparation for, any activity described above. This term does not include any activity by a vessel conducting authorized scientific research.

Fishing year is defined as January 1 through December 31.

Fishing community means a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economy needs and includes fishing vessel owners, operators, crew, and recreational fishers and United States fish processors that are based in such community.

Fixed gear (anchored nontrawl gear) includes longline, trap or pot, set net, and stationary hook-and-line gear (including commercial vertical hook-and-line) gears.

Gillnet is a single-walled, rectangular net which is set upright in the water.

Harvest guideline (HG) is an specified numerical harvest objective which is not a quota. Attainment of a HG does not require closure of a fishery.

Hook-and-line means one or more hooks attached to one or more lines. Commercial hook-and-line fisheries may be mobile (troll) or stationary (anchored).

Incidental catch or incidental species means groundfish species caught when fishing for the primary purpose of catching a different species.

Individual fishing quota (IFQ) means a federal permit under a limited access system to harvest a quantity of fish expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by a person.

Longline is a stationary, buoyed, and anchored groundline with hooks attached, so as to fish along the seabed.

Maximum sustainable yield is an estimate of the largest average annual catch or yield that can be taken over a significant period of time from each stock under prevailing ecological and environmental conditions. It may be presented as a range of values. One MSY may be specified for a group of species in a mixed-species fishery. Since MSY is a long-term average, it need not be specified annually, but may be reassessed periodically based on the best scientific information available.

Midwater (pelagic or off-bottom) trawl is a trawl in which the otter boards may contact the seabed, but the footrope of the net remains above the seabed. It includes pair trawls if fished in midwater. A midwater trawl has no rollers or bobbins on the net.

MSY stock size means the largest long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate units, that would be achieved under an MSY control rule in which the fishing mortality rate is constant. The proxy typically used in this fishery management plan is 40% of the estimated unfished biomass, although other values based on the best scientific information are also authorized.

Nontrawl gear means all legal commercial gear other than trawl gear.

Optimum yield means the amount of fish which will provide the greatest overall benefit to the U.S., particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems, is prescribed as such on the basis of the maximum sustainable yield from the fishery as reduced by any relevant economic, social, or ecological factor; and in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery.

Overfished describes any stock or stock complex whose size is sufficiently small that a change in management practices is required to achieve an appropriate level and rate of rebuilding. The term generally describes any stock or stock complex determined to be below its overfished/rebuilding threshold. The default proxy is generally 25% of its estimated unfished biomass; however, other scientifically valid values are also authorized.

Overfishing means fishing at a rate or level that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis. More specifically, overfishing is defined as exceeding a maximum allowable fishing mortality rate. For any groundfish stock or stock complex, the maximum allowable mortality rate will be set at a level not to exceed the corresponding MSY rate (F_{MSY}) or its proxy (e.g., $F_{35\%}$).

Processing or to process means the preparation or packaging of groundfish to render it suitable for human consumption, retail sale, industrial uses, or long-term storage, including, but not limited to, cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, but does not mean heading and gutting unless additional preparation is done.

Processor means a person, vessel, or facility that (1) engages in processing, or (2) receives live groundfish directly from a fishing vessel for sale without further processing.

Prohibited species are those species and species groups which must be returned to the sea as soon as is practicable with a minimum of injury when caught and brought aboard except when their retention is authorized by other applicable law. Exception may be made in the implementing regulations for tagged fish, which must be returned to the tagging agency, or for examination by an authorized observer.

Quota means a specified numerical harvest objective, the attainment (or expected attainment) of which causes closure of the fishery for that species or species group. Groundfish species or species groups under this FMP for which quotas have been achieved shall be treated in the same manner as prohibited species.

Recreational fishing means fishing for sport or pleasure, but not for sale.

Regulatory discards are fish harvested in a fishery which fishermen are required by regulation to discard whenever caught or are required by regulation to retain, but not sell.

Roller (or bobbin) trawl is a bottom trawl that has footropes equipped with rollers or bobbins made of wood, steel, rubber, plastic, or other hard material which keep the footrope above the seabed, thereby protecting the net.

Set net is a stationary, buoyed, and anchored gillnet or trammel net.

Stock Assessment and Fishery Evaluation (SAFE) document is a document prepared by the Council that provides a summary of the most recent biological condition of species in the fishery management unit, and the social and economic condition of the recreational and commercial fishing industries, and the fish processing industry. It summarizes, on a periodic basis, the best available information concerning the past, present, and possible future condition of the stocks and fisheries managed by the FMP.

Target fishing means fishing for the primary purpose of catching a particular species or species group (the target species).

A total catch limit is a portion of the OY for a groundfish FMU species, stock, or stock complex assigned to a defined fishery sector or to an individual vessel. Total catch is defined as landed catch plus bycatch (discard) mortality. The Council may specify total catch limits that are transferable or nontransferable among sectors or tradable or nontradable between vessels.

Trammel net is a gillnet made with two or more walls joined to a common float line.

Trap (or pot) is a portable, enclosed device with one or more gates or entrances and one or more lines attached to surface floats.

Spawning biomass is the biomass of mature female fish at the beginning of the year. If the production of eggs is not proportional to body weight, then this definition should be modified to be proportional to expected egg production.

Spawning biomass per recruit is the expected egg production of a female fish over its lifetime. Alternatively, this is the mature female biomass of an equilibrium stock divided by the mean level of recruitment that produced this stock.

Spear is a sharp, pointed, or barbed instrument on a shaft. Spears may be propelled by hand or by mechanical means.

Vertical hook-and-line gear (commercial) is hook-and-line gear that involves a single line anchored at the bottom and buoyed at the surface so as to fish vertically.

[Amended: 5, 11, 13, 17, 18, 19]

3.0 AREAS AND STOCKS INVOLVED

No changes in this chapter.

4.0 PREVENTING OVERFISHING AND ACHIEVING OPTIMUM YIELD

National Standard 1 requires that "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the U.S. fishing industry." (50 CFR 600.310(a))

"The determination of OY is a decisional mechanism for resolving the Magnuson-Stevens Act's multiple purposes and policies, implementing an FMP's objectives and balancing the various interests that comprise the national welfare. OY is based on MSY, or on MSY as it may be reduced ... [in consideration of social, economic or ecological factors].... The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing." (50 CFR Section 600.310(b))

This chapter addresses the essential considerations suggested for National Standard 1, as identified in the NMFS guidelines on the standard (600.310):

- Estimating MSY, estimated the MSY biomass and setting the MSY control rule (50 CFR 600.310(c); Section 4.2 of this Chapter).
- Specifying stock status determination criteria (maximum fishing mortality threshold and minimum stock size threshold, or reasonable proxies thereof) (50 CFR 600.310(d); Section 4.4 of this Chapter).
- Actions for ending overfishing and rebuilding overfished stocks (including the development and adoption of rebuilding plans) (50 CFR 600.310(e); Section 4.5 of this Chapter).
- Setting OY and apportionment of harvest levels (50 CFR 600.310(f); Section 4.6 of this Chapter).

In establishing OYs for West Coast groundfish, this FMP uses the interim step of calculating ABCs for major stocks or management units (groups of species). ABC is the MSY harvest level associated with the current stock abundance. Over the long term, if ABCs are fully harvested, the average of the ABCs would be MSY.

OY is set and apportioned under the procedures outlined in Chapter 5. As provided by Section 303(b)(11) of the Magnuson-Stevens Fishery Conservation and Management Act, the Council may establish a research reserve for any stock, that is within the ABC but above and separate from the OY for that stock.

[Added: 16-1]

4.1 Species Categories

BMSY, ABC and the overfished/rebuilding stock size threshold cannot be precisely defined for all species, because of the absence of available information for many species managed under the FMP. For the purpose of setting MSY, ABC, the maximum fishing mortality threshold (MFMT), the minimum stock size threshold (MSST), OY and rebuilding standards, three categories of species are identified. The first are the relatively few species for which a quantitative stock assessment can be conducted on the basis of catch-at-age or other data. ABCs and overfished/rebuilding thresholds can generally be calculated for these species. The second category includes a large number of species for which some biological indicators are available, but a quantitative analysis cannot be conducted. It is difficult to estimate overfished and overfishing thresholds for the second category of species a priori, but indicators of long-term, potential overfishing can be identified. ABCs for species in this category are typically set at a constant level and some monitoring is necessary to determine if this level of catch is causing a slow decline in stock abundance. The third category includes minor species which are caught, but for which there is, at best, only information on landed biomass. For species in this category, it is impossible to determine MSY, ABC, or an overfished threshold

[Amended: 16-1]

4.2 Determination of MSY, or MSY Proxy, and B_{MSY}

Harvest policies are to be specified according to standard reference points such as MSY (MSY, interpreted as a maximum average achievable catch under prevailing ecological and environmental conditions over a prolonged period). The long-term average biomass associated with fishing at F_{MSY} is B_{MSY}. In this FMP, MSY generally refers to a constant F control rule that is assumed to produce the maximum average yield over time while protecting the spawning potential of the stock. Thus the constant F control rule is generally the proxy for the MSY control rule. Fishing rates above F_{MSY} eventually result in biomass smaller than B_{MSY} and produce less harvestable fish on a sustainable basis. The biomass level that produces MSY (i.e., B_{MSY}) is generally unknown and assumed to be variable over time due to long-term fluctuations in ocean conditions, so that no single value is appropriate. During periods of unfavorable environmental conditions it is important to account for reduced sustainable yield levels.

The problem with an F_{MSY} control rule is that it is tightly linked to an assumed level of density-dependence in recruitment, and there is insufficient information to determine the level of density-dependence in recruitment for many West Coast groundfish stocks. Therefore, the use of approximations or proxies is necessary. Absent a more accurate determination of F_{MSY}, the Council will apply default MSY proxies. The current (2001) proxies are: F40% for flatfish and whiting, $F_{50\%}$ for rockfish (including thornyheads) and $F_{45\%}$ for all species such as sablefish and lingcod. However, values ($F_{40\%}$, $F_{45\%}$, and $F_{50\%}$) are provided here as examples only and are expected to be modified from time to time as scientific knowledge improves. If available information is sufficient, values of F_{MSY}, B_{MSY}, and more appropriate harvest control rules may be developed for any species or species group.

At this time, it is generally believed that, for many species, $F_{45\%}$ strikes a balance between obtaining a large fraction of the MSY if recruitment is highly insensitive to reductions in spawning biomass and preventing a rapid depletion in stock abundance if recruitment is found to be extremely sensitive to reductions in spawning biomass. The long-term expected yield under an $F_{45\%}$ policy depends upon the (unknown) level of density-dependence in recruitment. The recommended level of harvest will reduce the average lifetime egg production by each female entering the stock to 45% of the lifetime egg production for females that are unfished.

Because the level of recruitment is expected to decline somewhat as a stock is fished at $F_{45\%}$, the expected B_{MSY} proxy is less than 45% of the unfished biomass. A biomass level of 40% is a reasonable proxy for BMSY. The short-term yield under an $F_{45\%}$ policy will vary as the abundance of the exploitable stock varies. This is true for any fishing policy that is based on a constant exploitation rate. The abundance of the stock will vary, because of the effects of fishing, and because of natural variation in recruitment. When stock abundance is high (i.e., near its average unfished level), short-term annual yields can be approximately two to three times greater than the expected long-term average annual yield. For many of the long-lived groundfish species common on the West Coast, this "fishing down" transition can take decades. Many of the declines in ABC that occurred during the 1980s were the result of this transition from a lightly exploited, high abundance stock level to a fully exploited, moderately abundant stock level. Further declines below the overfished levels in the 1990s were due in large part to harvest rate policies that were later discovered to not be sustainable. More recent stock assessments indicate that West Coast groundfish stocks likely have lower levels of productivity than other similar species worldwide. Based on this retrospective information, harvest rate policies in the 1990s were too high to maintain stocks at B_{MSY}. The Council revised its harvest rate policies for lower levels of production, described below.

Scientific information as of 1997 (Clark 1993; Ianelli and Heifetz 1995; Mace 1994) indicated that $F_{35\%}$ may not be the best approximation of FMSY, given more realistic information about recruitment than was initially used by Clark in 1991. In his 1993 publication Clark extended his 1991 results by improving the realism of his simulations and analysis. In particular he (1) modeled stochasticity into the recruitment process, (2) introduced serial correlation into recruitment time series, and (3) performed separate analyses for the Ricker and Beverton-Holt spawner-recruit functions. For rockfish, these changes improved the realism of his spawning biomass per recruit (SPR) harvest policy calculations, because these species are known to have stochastic recruitment and they appear to display serial correlation in recruitments (especially on interdecadal time scales), and because the Beverton-Holt spawner-recruit curve may be biologically the most plausible recruitment model. The effect of each of these changes, in isolation and in aggregate, was to decrease FMSY. Consequently, the estimated SPR reduction needed to provide an optimal F_{MSY} proxy (defined as that level of fishing which produces the largest assured proportion of MSY), must necessarily be increased. Clark concluded that $F_{40\%}$ is the optimal rate for fish stocks exhibiting recruitment variability similar to Alaska groundfish stocks. Likewise, Mace (1994) recommended the use of $F_{40\%}$ as the target mortality rate when the stock-recruitment relationship is unknown. Lastly, Ianelli and Heifitz (1995) determined that F44% was a good F_{MSY} proxy for Gulf of Alaska Pacific ocean perch, although he subsequently indicated that a recent recruitment to that stock was larger than expected and that $F_{44\%}$ may be too conservative in that case.

Based on this information and advice by its Groundfish Management Team, in 1997 the Council concluded that $F_{40\%}$ should be used as the proxy for FMSY for rockfish in the absence of specific knowledge of recruitment or life history characteristics which would allow a more accurate determination of FMSY. This proxy was later revised based on further Scientific and Statistical Committee (SSC) investigation into the appropriate FMSY proxies in 2000.

In the spring of 2000, the Council's SSC sponsored a workshop to review the Council's groundfish exploitation rate policy. The workshop explored the historic use of different fishing mortality (F) rates and found that the Council's past practices have generally changed in response to new information from the scientific community. Starting in the early 1990s, the Council used a standard harvest rate of F35%. The SSC's workshop participants reported that new scientific studies in 1998 and 1999 had shown that the $F_{35\%}$ and $F_{40\%}$ rates used by the Council had been too aggressive for Pacific Coast groundfish stocks, such that some groundfish stocks could not maintain a viable population over time. A 1999 study, The Meta-Analysis of the Maximum Reproductive Rate for Fish Populations to Estimate Harvest Policy; a Review (Myers, *et al.* 2000) showed that Pacific Coast groundfish stocks, particularly rockfish, have very low productivity compared to other, similar species worldwide. One prominent theory about the reason for this low productivity is the large-scale North Pacific climate shifts that are thought to cycle Pacific Coast waters through warm and cool phases of 20-30 years duration. Pacific Coast waters shifted to a warm phase around 1977-1978, with ocean conditions less favorable for Pacific Coast groundfish and other fish stocks. Lower harvest rates are necessary to guard against steep declines in abundance during these periods of low productivity (low recruitment). After an intensive review of historic harvest rates, and current scientific literature on harvest rates and stock productivity, the SSC workshop concluded that $F_{40\%}$ is too aggressive for many Pacific Coast groundfish stocks, particularly for rockfish. For 2001 and beyond, the Council adopted the SSC's new recommendations for harvest policies of: $F_{40\%}$ for flatfish and whiting, $F_{50\%}$ for rockfish (including thornyheads) and $F_{45\%}$ for other groundfish such as sablefish and lingcod.

In the past, F_{MSY} fishing rates were treated by the Council (as intended) as targets. Under the Magnuson-Stevens Act as amended in 1996, these fishing rates are more appropriately considered to be thresholds that should not be exceeded (see Section 4.4).

The Council will consider any new scientific information relating to calculation of MSY or MSY proxies and may adopt new values based on improved understanding of the population dynamics and harvest of any species or group of species.

While BMSY may be set based on the averaged unfished abundance ($B_{unfished}$) there are many possible approximations and estimates of mean $B_{unfished}$. If the necessary data exist, the following standard methodology is the preferred approach:

$$\text{mean } B_{unfished} = \text{mean } R * SPR(F=0)$$

Where mean R is the average estimated recruitment expected under unfished conditions, and SPR(F=0) is the spawning potential per recruit at zero fishing mortality rate. SPR(F=0) is normally available as part of the calculation leading to determination of $F_{45\%}$ and is equivalent to $F_{100\%}$.

[Amended: 5, 11, 16-1]

4.3 Determination of ABC

In establishing OYs for West Coast groundfish, this FMP utilizes the interim step of calculating ABCs for major stocks or management units (groups of species). ABC is the MSY harvest level associated with the current stock abundance. Over the long term, if ABCs are fully harvested, the average of the ABCs would be MSY.

4.3.1 Stocks with Quantitative Assessments, Category 1

The stocks with quantitative assessments are those that have recently been assessed by a catch-at-age analysis. Annual evaluation of the appropriate MSY proxy (e.g., F45%) for species in this category will require some specific information in the SAFE document. Estimated age-specific maturity, growth, and availability to the fishery (with evaluation of changes over time in these characteristics) are sufficient to determine the relationship between fishing mortality and yield-per-recruit and spawning biomass-per-recruit. The estimated time series of recruitment, spawning biomass, and fishing mortality are also required to determine whether recent trends indicate a point of concern. In general, ABC will be calculated by applying $F_{45\%}$ (or F40%, F50%, or other established MSY proxy) to the best estimate of current biomass. This current biomass estimate may be for a single year or the average of the present and several future years. Thus, ABC may be intended to remain constant over a period of three or more years.

4.3.2 Stocks with ABC Set by Nonquantitative Assessment, Category 2

These stocks with ABC set by nonquantitative assessments typically do not have a recent, quantitative assessment, but there may be a previous assessment or some indicators of the status of the stock. Detailed biological information is not routinely available for these stocks, and ABC levels have typically been established on the basis of average historical landings. Typically, the spawning biomass, level of recruitment, or the current fishing mortality rate for Category 2 stocks are unknown. The Council places high priority on improving the information for managing these stocks so that they may be moved to

Category 1 status.

4.3.3 Stocks Without ABC Values, Category 3

Of the 80-plus groundfish species managed under the FMP, ABC values have been established for only about 25. The remaining species are incidentally landed and usually are not listed separately on fish landing receipts. Information from fishery independent surveys are often lacking for these stocks, because of their low abundance or they are not vulnerable to survey sampling gear. Until sufficient quantities of at-sea observer program data are available or surveys of other fish habitats are conducted, it is unlikely that there will be sufficient data to upgrade the assessment capabilities or to evaluate the overfishing potential of these stocks. Interim ABC values may be established for these stocks based on qualitative information, including advice from the Council's advisory entities.

[Amended: 11, 12, 16-1]

4.4 Precautionary Thresholds and Overfishing Status Determination Criteria

The National Standard Guidelines define two thresholds that are necessary to maintain a stock at levels capable of producing MSY: the maximum fishing mortality threshold (MFMT) and a minimum stock size threshold (MSST). These two limits are intended for use as benchmarks to decide if a stock or stock complex is being overfished or is in an overfished state. The MFMT and MSST are intrinsically linked through the MSY control rule, which specifies how fishing mortality or catches could vary as a function of stock biomass in order to achieve yields close to MSY.

4.4.1 Determination of Precautionary Thresholds

The precautionary threshold is the biomass level at which point the harvest rate will be reduced to help the stock return to the MSY level (see Section 4.5.1 “Default Precautionary and Interim Rebuilding OY Calculation”). The precautionary biomass threshold is in addition to the overfishing and overfished/rebuilding thresholds required under ths Magnuson-Stevens Act (MFMT and MSST). The precautionary biomass threshold is higher than the overfished biomass (MSST). Because BMSY is a long term average, biomass will by definition be below BMSY in some years and above BMSY in other years. Thus, even in the absence of overfishing, biomass may decline to levels below BMSY due to natural fluctuation. By decreasing harvest rates when biomass is below BMSY but maintaining MSY control rule (or proxy control rule) harvest rates for biomass levels above MSY, the precautionary threshold and accompanying response effectively constitute a control rule that manages for harvests lower than MSY and an average biomass above MSY.

The precautionary threshold is established only for category 1 species. The precautionary threshold will be the BMSY level, if known. The default precautionary threshold will be 40% of the estimated unfished biomass level. The Council may recommend different precautionary thresholds for any species or species group based on the best scientific information about that species or group. It is expected the threshold will be between 25% and 50% of the estimated unfished biomass level.

4.4.2 Determination of Overfishing Threshold

In this FMP, for Category 1 species, the term “overfishing” is used to denote situations where catch exceeds or is expected to exceed the established ABC or MSY proxy ($F_{x\%}$). This can also be expressed as where catch exceeds or is expected to exceed the MFMT. The term “overfished” describes a stock whose abundance is below its overfished/rebuilding threshold, or MSST. Overfished/rebuilding thresholds, in general, are linked to the same productivity assumptions that determine the ABC levels. The default value of this threshold is 25% of the estimated unfished biomass level or 50% of B_{MSY}, if known. The MFMT is simply the value(s) of fishing mortality in the MSY control rule. Technically, exceeding FMSY constitutes overfishing.

For Category 2 species, the following may be evaluated as potential indicators of overfishing:

- catch per effort from logbooks
- catch area from logbooks
- index of stock abundance from surveys
- stock distribution from surveys
- mean size of landed fish

If declining trends persist for more than three years, then a focused evaluation of the status of the stock, its ABC, and overfishing threshold will be quantified. If data are available, such an evaluation should be conducted at approximately five year intervals even when negative trends are not apparent. In fact, many stocks are in need of re-evaluation to establish a baseline for monitoring of future trends. Whenever an evaluation indicates the stock may be declining and approaching an overfished state, the Council should:

1. Improve data collection for this species so it can be moved to Category 1.

2. Determine the rebuilding rate that would allow the stock to return to MSY in no longer than ten years.

Information from fishery independent surveys is often lacking for Category 3 species because of their low abundance or because they are not vulnerable to survey sampling gear. Until sufficient data become available from the at-sea observer program, the risk of overfishing these species cannot be fully evaluated.

4.4.3 Determination of Overfished/Rebuilding Thresholds

The MSST (overfished/rebuilding threshold) is the default value of 25% of the estimated unfished biomass level or 50% of B_{MSY}, if known. The overfished/rebuilding threshold (also referred to as $B_{rebuild}$), is generally in the range of 25% to 40% of $B_{unfished}$, and may also be written as

$B_{rebuild}$ = x% * mean R * SPR(F=0)

The default overfished/rebuilding threshold for category 1 groundfish is $0.25B_{unfished}$. The Council may establish different thresholds for any species based on information provided in stock assessments, the SAFE document, or other scientific or groundfish management-related report. For example, if B_{MSY} is known, the overfished threshold may be set equal to 50% of that amount. The Council may also specify a lower level of abundance where catch or fishing effort is reduced to zero. This minimum abundance threshold (B_{MIN}) would correspond to an abundance that severely jeopardizes the stock's ability to recover to B_{MSY} in a reasonable length of time.

[Amended: 11, 12, 16-1]

4.5 Ending Overfishing and Rebuilding

4.5.1 Default Precautionary and Interim Rebuilding OY Calculation

The precautionary threshold, defined in Section 4.4.1, is used to trigger a precautionary management approach. If biomass declines to a level that requires rebuilding (below the MSST), the precautionary management approach also provides an interim rebuilding harvest control policy to guide ~~the~~ setting the OY until the Council sets a new rebuilding policy specific to the conditions of the stock and fishery. The default OY/rebuilding policy can be described as an "ICES-type catch-based approach" that consists of a modification of the catch policy, where catch (C) declines from $C(F_{MSY})$ at the precautionary threshold in a straight line to F=0 at the minimum abundance threshold of ten percent of the estimated mean unfished biomass (sometimes called pristine or virgin biomass or reproductive potential). This approach could also be described as an OY based on a variable FSPR that is progressively more conservative at low biomass levels. The abbreviated name for this is the "40-10" default adjustment. In most cases, there is inadequate information to estimate FMSY; in such cases, the best proxy for F_{MSY} will be used. The default proxy values will be $F_{40\%}$ for flatfish and whiting, $F_{50\%}$ for rockfish in the Sebastes complex and $F_{45\%}$ for other species such as sablefish and lingcod. The Council anticipates scientific information about the population dynamics of the various stocks will improve over time and that this information will result in improved estimates of appropriate harvest rates and MSY proxies. Thus, these initial default proxy values will be replaced from time to time. Such changes will not require amendment to the FMP, but the scientific basis for new values must be documented.

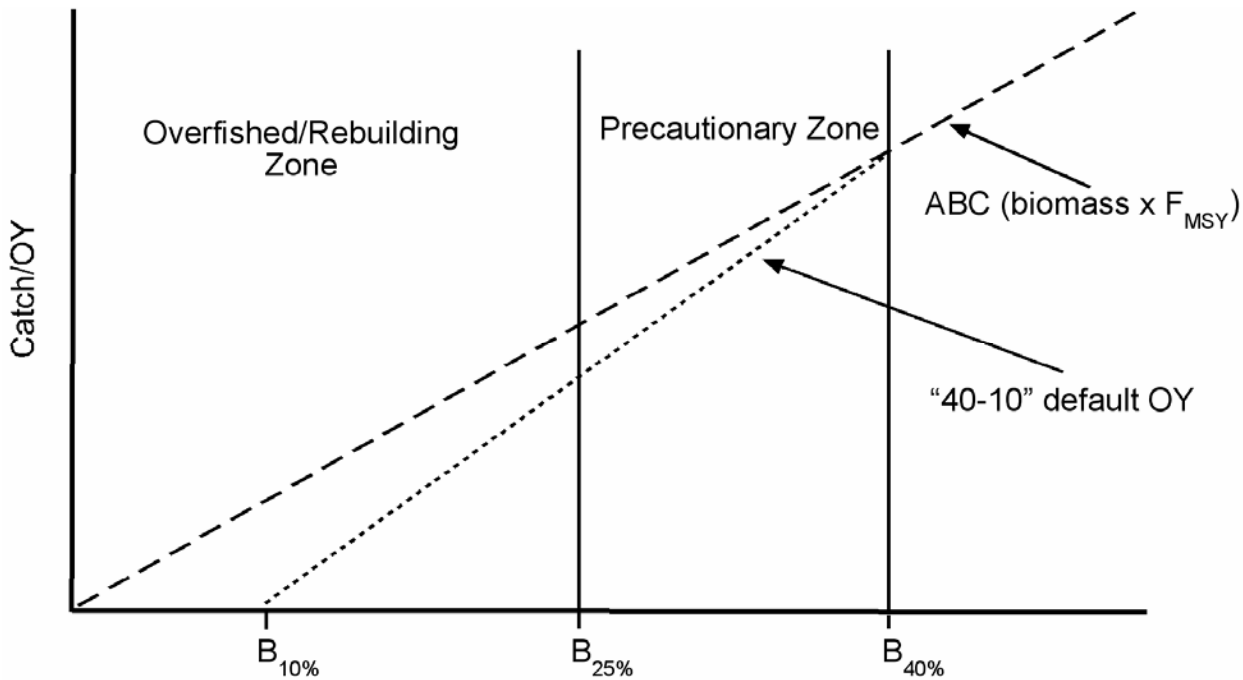

FIGURE 4-1. Illustration of default OY rule compared to ABC.

The greater amount of catch reduction applied below the precautionary threshold will foster quicker return to the MSY level. If a stock falls below its overfished/rebuilding threshold, this line would be used as the interim rebuilding plan during the year until the Council develops a formal rebuilding plan. The point at which the line intersects the horizontal axis does not necessarily imply zero catch would be allowed, but rather is for determining the slope of the line.

In order to apply this default approach, a minimal amount of information is necessary; only stocks in Category 1 can be managed in this way. For stocks with inadequate information to apply this approach, the Council will consider other methods of ensuring that overfishing will be avoided. The Council will consider the approaches discussed in the National Standard Guidelines in developing such recommendations for stocks in Categories 2 and 3.

4.5.2 Procedures For Calculating Rebuilding Parameters

The Magnuson-Stevens Act and National Standard Guidelines provide a descriptive framework for developing strategies to rebuild overfished stocks. This framework identifies three parameters: a minimum time in which an overfished stock ~~may~~ can rebuild to its target biomass (denoted T_{MIN}), a maximum permissible time period for rebuilding the stock to its target biomass (T_{MAX}), and a target year, falling within the time period ~~represented~~ between T_{MIN} and T_{MAX} and representing the ~~best of estimate of~~ the year by which the stock ~~will~~ can be rebuilt, as soon possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the stock of fish within the marine ecosystem (T_{TARGET}).

T_{MIN}, the lower limit of the specified time period for rebuilding, will be determined by the status and biology of the stock or stock complex and its interactions with other components of the marine ecosystem or environmental conditions, and is defined as the amount of time that would be required for rebuilding if fishing mortality were eliminated entirely.

If ~~the lower limit~~ T_{MIN} is less than ten years, then the specified time period for rebuilding may be adjusted upward so that the rebuilding period is as short as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the stock of fish within the marine ecosystem, ~~to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participates,~~ except that no such upward adjustment may result in the specified time period exceeding ten years (which would then constitute T_{MAX}), unless management measures under an international agreement in which the United States participates dictate otherwise.

If the ~~lower limit~~ T_{MIN} is ten years or greater, then the specified time period for rebuilding may be adjusted upward so that the rebuilding period is as short as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the stock of fish within the marine ecosystem, ~~to the extent warranted by the needs of fishing communities and recommendations by international organizations in which the United States participate~~s, except that no such upward adjustment can exceed the rebuilding period calculated in the absence of fishing mortality, plus one mean generation time or equivalent period based on the species' life-history characteristics. For example, if a stock could be rebuilt within 12 years in the absence of any fishing mortality, and has a mean generation time of eight years, the maximum allowable time to rebuild would be ~~the rebuilding period could be as long as~~ 20 years, which is T_{MAX}.

The Council may consider a number of factors in determining the time period for rebuilding, including:

1. The status and biology of the stock or stock complex.

2. Interactions between the stock or stock complex and other components of the marine ecosystem or environmental conditions.

3. The needs of fishing communities.

4. Recommendations by international organizations in which the United States participates.

5. Management measures under an international agreement in which the United States participates.

Calculating Rebuilding Probabilities

Stock assessment results form the basis of a rebuilding analysis, which in turn is used to develop rebuilding policies and choose the rebuilding parameters identified in each rebuilding plan. The elements of rebuilding analyses are described in the SSC Terms of Reference for Rebuilding Analyses (SSC 2001). This guidance has been incorporated into a computer program (Punt 2002). In the analysis the probability that the overfished stock will reach its target biomass is determined with respect to T_{MIN}, T_{MAX}, and T_{TARGET}. The methods for calculating the values of these parameters are described below. This is a simplified explanation of the current methodology; for example, equations and technical specifications are omitted. The SSC may revise their terms of reference in the future and the computer program undergoes continued refinement and elaboration.

The rebuilding analysis program uses "Monte Carlo simulation" to derive a probability estimate for a given rebuilding strategy. This method projects population growth many times in separate simulations. It accounts for possible variability by randomly choosing the value of a key variable—in this case total recruitment or recruits per spawner—from a range of values. These values can be specified empirically, by listing some set of historical values, or by a relationship based on a model. The SSC recommends that the rebuilding analyses use historical values. Because of this variability in a key input value, each simulation will show a different pattern of population growth. As a result, a modeled population may reach the target biomass that defines a rebuilt stock (B_{MSY}) in a different year in each of the simulations.

This technique ~~can be used~~ ~~is~~ first used to calculate T_{MIN} in probabilistic terms, which is defined as the time needed to reach the target biomass in the absence of fishing with a 50% probability. In other words, in half the simulations the target biomass was reached in some year up to and including the computed T_{MIN}. Given T_{MIN}, T_{MAX} is computed as 10 years or by adding the value of one mean generation time to T_{MIN}, if T_{MIN} is greater than or equal to 10 years.

~~After determining T_{MAX}, multiple Monte Carlo simulations are conducted, varying the fishing mortality rate. This determines the relationship between F and the probability of the stock being rebuilt by T_{MAX} (denoted P_{MAX}). Since a higher P_{MAX} probability must be achieved by lowering the fishing mortality rate (other things being equal) there is a tradeoff between fishery harvests and rebuilding speed in probabilistic terms. As fishing mortality is reduced, the likelihood that the stock will recover in this maximum time period increases.~~

A target year, T_{TARGET}, is ~~then computed as the median rebuilding year for each related F and P_{MAX}. The median year is simply the year by which half of all cases have already rebuilt, and is unique for a given F and P_{MAX}.~~ set as a year at T_{MIN} or greater, which does not exceed T_{MAX} ,and which is as short as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the stock of fish within the marine ecosystem. Prior to Amendment 16-4, the Council set T_{TARGET} in part by considering the probability of rebuilding the stock by T_{MAX}. The Council may continue to review the probability of rebuilding the stock by T_{MAX} given differing F rates, a reference parameter known as "P_{MAX}." The Magnuson-Stevens Act, however, simply requires that rebuilding periods be as short as possible, taking into account:

- the status and biology of any overfished stocks of fish;
- the needs of fishing communities;
- recommendations by international organizations in which the United States participates;
- the interaction of the overfished stock of fish within the marine ecosystem. (§304(e)(4)(A)(i))

It is important to recognize that some of the terms introduced and described above represent policy decisions at the national level and the Council **does not have a choice** in setting their values. The dates for T_{MIN} and T_{MAX} are determined based on guidelines established at the national level. Mean generation time is a biological characteristic that cannot be chosen by policymakers. Thus, the Council cannot choose these values and then use them as a basis for management. Defined in national guidelines, T_{MIN} is a consequence of the productivity of the fish stock and is calculated by fishery biologists based on information they get from a particular stock. Similarly, T_{MAX}, which is calculated from T_{MIN}, does not represent a Council choice.

Policy flexibility comes into play in determining T_{TARGET}, or the time by which the stock is projected to rebuild. As explained earlier, the time to rebuild must be as short as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the stock of fish within the marine ecosystem. ~~Fundamentally,~~ W~~w~~hen developing a management strategy, the Council **can** choose a fishing mortality rate and corresponding annual level of fishing. However, when rebuilding overfished species, the choice of F ~~can be~~ is based on ~~either~~ the value of T_{TARGET} ~~or P_{MAX}~~, keeping in mind that these ~~three~~ values cannot be chosen independently of one another. In other words, the Council may choose one ~~of these~~ value~~s~~ and derive the other ~~two~~ from it, but they cannot choose these values ~~for two of these terms~~ independently of ~~the third~~ each other.

4.5.3 Stock Rebuilding Plans

As required by the Magnuson-Stevens Act, within one year of being notified by the Secretary that a stock is overfished or approaching a condition of being overfished, the Council will prepare a recommendation to end the overfished condition and rebuild the stock(s) or to prevent the overfished condition from occurring. For a stock that is overfished, the rebuilding plan will specify a time period for ending the overfished condition and rebuilding the stock. Overfishing restrictions and recovery benefits should be fairly and equitably allocated among sectors of the fishery.

Certain elements of a rebuilding plan developed by the Council, as specified in Section 4.5.3.2 (Contents of Rebuilding Plans), will be submitted to the Secretary as an FMP amendment and implementing regulations. Changes to key rebuilding plan elements will be accomplished through full (notice and comment) rulemaking. Once approved by the Secretary, a rebuilding plan will remain in effect for the specified duration of the rebuilding program, or until modified. The Council will make all approved rebuilding plans available in the annual SAFE document or by other means. The Council may recommend that the Secretary implement interim measures to reduce overfishing until the Council's program has been developed and implemented.

The Council intends its stock rebuilding plans to provide targets, checkpoints, and guidance for rebuilding overfished stocks to healthy and productive levels. They should provide a clear vision of the intended results and the means to achieve those results. They will provide the strategies and objectives that regulations are intended to achieve, and proposed regulations and results will be measured against the rebuilding plans. It is likely that rebuilding plans will be revised over time to respond to new information, changing conditions, and success or lack of success in achieving the rebuilding schedule and other goals. If, in response to these revisions, the Council recommends changes to the management target for a particular stock, such changes will be published through full (notice and comment) rulemaking as described in Section 6.2 of this FMP. As with all Council activities, public participation is critical to the development, implementation and success of management programs.

4.5.3.1 Goals and Objectives of Rebuilding Plans

The overall goals of rebuilding programs are to (1) achieve the population size and structure that will support the maximum sustainable yield within a ~~the~~ specified time period that is as short as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the stock of fish within the marine ecosystem; (2) minimize, to the extent practicable, the adverse social and economic impacts associated with rebuilding, including adverse impacts on fishing communities; (3) fairly and equitably distribute both the conservation burdens (overfishing restrictions) and recovery benefits among commercial, recreational, and charter fishing sectors; (4) protect the quantity and quality of habitat necessary to support the stock at healthy levels in the future; and (5) promote widespread public awareness, understanding and support for the rebuilding program. More specific goals and objectives may be developed in the rebuilding plan for each overfished species.

To achieve the rebuilding goals, the Council will strive to (1) explain the status of the overfished stock, pointing out where lack of information and uncertainty may require that conservative assumptions be made in order to maintain a risk-averse management approach; (2) identify present and historical harvesters of the stock; (3) where adequate harvest sharing plans are not already in place, develop harvest sharing plans for the rebuilding period and for when rebuilding is completed; (4) set harvest levels that will achieve the specified rebuilding schedule; (5) implement any necessary measures to allocate the resource in accordance with harvest sharing plans; (6) promote innovative methods to reduce bycatch and bycatch mortality of the overfished stock; (7) monitor fishing mortality and use available stock assessment information to evaluate the condition of the stock; (8) identify any critical or important habitat areas and implement measures to ensure their protection; and (9) promote public education regarding these goals, objectives, and the measures intended to achieve them.

4.5.3.2 Contents of Rebuilding Plans

Generally, rebuilding plans will contain:

1. A description of the biology and status of the overfished stock and fisheries affected by stock rebuilding measures.

2. A description of how rebuilding parameters for the overfished stock were determined (including any calculations that demonstrate the scientific validity of parameters).

3. Estimates of rebuilding parameters ($B_{UNFISHED}$, B_{MSY}, T_{MIN}, T_{MAX}, ~~and the probability of reaching target biomass by this date~~, and T_{TARGET}) at the time of rebuilding plan adoption.

4. A description of the fishing communities' needs that were considered at the time of adoption of the plan.

~~4.~~ 5. The process, and any applicable standards, that will be used during periodic review to evaluate progress in rebuilding the stock to the target biomass (see Section 4.5.3.5).

~~5.~~ 6. Any management measures the Council may wish to specifically describe in the FMP, which facilitate stock rebuilding in the specified period. (These measures would be in addition to any existing measures typically implemented through annual or biennial management. See Section 4.5.3.4 for more information.)

~~6.~~ 7. Any goals and objectives in addition to or different from those listed in the preceding section.

~~7.~~ 8. Potential or likely allocations among sectors.

~~8.~~ 9. For fisheries managed under international agreement, a discussion of how the rebuilding plan will reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.

~~9.~~ 10. Any other information that may be useful to achieve the rebuilding plan's goals and objectives.

The following questions also serve as a guide in developing rebuilding plans:

1. What is the apparent cause of the current condition (historical fishing patterns, a declining abundance or recruitment trend, a change in assessment methodology, or other factors)?

2. Is there a downward trend in recruitment that may indicate insufficient compensation in the spawner-recruitment relationship?

3. Based on ~~an~~ a comparison of historical harvest levels (including discards) relative to recommended ABC levels, has there been chronic over-harvest?

4. Is human-induced environmental degradation implicated in the current stock condition? Have natural environmental changes been observed that may be affecting growth, reproduction, and/or survival?

5. Would reduction in fishing mortality be likely to improve the condition of the stock?

6. What types of fishing communities rely on catch of this particular stock, or on catch of stocks that co-occur with this stock?

~~6.~~ 7. Is the particular species caught incidentally with other species? Is it a major or minor component in a mixed-stock complex?

~~7.~~ 8. What types of management measures are anticipated and/or appropriate to achieve the biological, social, economic, and community goals and objectives of the rebuilding plan?

Rebuilding plan documents are distinct from the analytical documents required by the National Environmental Policy Act and other legal mandates, although they will reflect the contents of those analyses in a much briefer form. Rebuilding plan elements incorporated into the FMP (in Section 4.5.4) summarize the contents enumerated in this section. Rebuilding plans as a whole will be published in the next annual SAFE document after their approval.

Any new rebuilding program will commence as soon as the first measures to rebuild the stock or stock complex are implemented.

Fishing communities need a sustainable fishery that: is safe, well-managed, and profitable; provides jobs and incomes; contributes to the local social fabric, culture, and image of the community; and helps market the community and its services and products.

4.5.3.3 Process for Development and Approval of Rebuilding Plans

Upon receiving notification that a stock is overfished, the Council will identify one or more individuals to draft the rebuilding plan. A draft of the plan will be reviewed and preliminary action taken (tentative adoption or identification of preferred alternatives), followed by final adoption at a subsequent meeting. The tentative plan or alternatives will be made available to the public and considered by the Council at a minimum of two meetings, unless stock conditions suggest more immediate action is warranted. Upon completing its final recommendations, the Council will submit the proposed rebuilding plan or revision to an existing plan to NMFS for concurrence. A rebuilding plan will be developed following the standard procedures for considering and implementing an FMP amendment under the Magnuson-Stevens Act and other applicable law.

The following elements in each rebuilding plan will be incorporated into the FMP in Section 4.5.4:

1. A brief description of the status of the stock and fisheries affected by stock rebuilding measures at the time the rebuilding plan was prepared.

2. The methods used to calculate stock rebuilding parameters, if substantially different from those described in Section 4.5.2.

3. An estimate at the time the rebuilding plan was prepared of:
   - unfished biomass (Bunfished) and target biomass (BMSY);
   - the year the stock would be rebuilt in the absence of fishing (T_{MIN});
   - T_{MIN} plus one mean generation time (T_{MAX}); and
   - ~~the year the stock would be rebuilt if the maximum time period permissible under National Standard Guidelines were applied (T_{MAX}) and the estimated probability that the stock would be rebuilt by this date based on the application of stock rebuilding measures; and~~
   - the year in which the stock would be rebuilt based on the application of stock rebuilding measures that achieve rebuilding as soon as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the overfished stock within the marine ecosystem (T_{TARGET}).

4. A description of the harvest control rule (e.g., constant catch or harvest rate) and the specification of this parameter. The types of management measures that will be used to constrain harvests to the level required ~~implied~~ by the control rule will also be described (see also Section 4.5.3.4). These two elements, the harvest control rule and a description of management measures, represents the rebuilding strategy intended to rebuild the stock by the target year.

It is likely that over time the parameters listed above will change. It must be emphasized that the values enumerated in the FMP represent estimates at the time the rebuilding plan is prepared. Therefore, the FMP need not be amended if new estimates of these values are calculated. The values for these parameters found in the FMP are for reference, so that managers and the public may track changes in the strategy used to rebuild an overfished stock. However, any new estimates of the parameters listed above will be published in the SAFE documents as they become available.

4.5.3.4 Updating Key Rebuilding Parameters

In addition to an initial specification in the FMP, the target year (T_{TARGET}) and the harvest control rule (type and numerical value) will also be specified in regulations. If new information indicates a need to change the value of either of these two parameters, such a change will be accomplished through full (notice and comment) rulemaking as described in Section 6.2 of this FMP. The target year is the year by which the stock would be rebuilt to its target biomass. Therefore, if a subsequent analysis identifies an earlier target year for the current fishing mortality rate (based on the harvest control rule), there is no obligation to change in regulations either the target year (to the computed earlier year) or the harvest control rule (to delay rebuilding to the original target year). Stock assessments for overfished species are typically conducted every two years. Stock assessments and rebuilding analyses use mathematical models to predict a stock's current abundance, as well as project future abundance and recruitment. In any mathematical model that uses a variety of data sources, as the stock assessments do, model results tend to vary from one assessment to the next within some range of values. This expected variation means that, when the Council and SSC review a new overfished species stock assessment and rebuilding model, they must also consider whether the result of that model or models show a rebuilding trajectory that varies from the previously-predicted trajectory to a significant degree. If the variation between the stock assessments and rebuilding analyses for a particular species do not show significant differences in the rebuilding trajectory for that species, they are mathematically considered to be essentially the same. In that circumstance, the Council will likely not need to revise the T_{TARGET} or harvest control rule for that species. Since the target year is ~~a~~ the key rebuilding parameter, it should only be changed after careful deliberation. For example, the Council might recommend that the target year be changed if, based on new information about the status and/or biology of the stock, they determine that the existing target year is later than the recomputed maximum rebuilding time (T_{MAX}) or if a recomputed harvest control rule would result in such a low optimum yield as to cause substantial socioeconomic impacts. These examples are not definitive: the Council may elect to change the target year because of other circumstances. However, any change to the target year or harvest control rule must be supported by commensurate analysis that demonstrates that the new target year is a target to rebuild the stock as soon as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of the stock within the marine ecosystem.

4.5.3.5 Implementation of Actions Required Under the Rebuilding Plan

NMFS will implement or adjust, with the adoption of the rebuilding plan, any management measures not already in effect that are necessary to implement the rebuilding plan. Many necessary measures may already be in place through the standard management process. Because of the complex nature of the fishery and the interaction of various stocks, regulations will need to be adjusted over the periods of the rebuilding plans. Management measures will be adjusted, or new measures will be developed and implemented in the future, in order to best implement each rebuilding plan throughout the life of that plan.

Once a rebuilding plan is adopted, certain measures required in the rebuilding plan may need to be implemented through authorities and processes already described in the FMP. Management actions to achieve OY harvest, and objectives related to rebuilding requirements of the Magnuson-Stevens Act and goals and objectives of the FMP (each of which may require a slightly different process) include: automatic actions, notices, abbreviated rulemaking actions, and full rulemaking actions. (These actions are detailed in Section 4.6, Chapter 5, and Section 6.2.) Allocation proposals require consideration as specified in the allocation framework (see Section 6.2.3.1). Any proposed regulations to implement the rebuilding plan will be developed in accordance with the framework procedures of this FMP.

Any rebuilding management measures that are not already authorized under the framework of the existing FMP, or specified in the FMP consequent of rebuilding plan adoption, will be implemented by further FMP amendments. These plan amendments may establish the needed measures or expand the framework to allow the implementation of the needed measures under framework procedures.

The Council may designate a state or states to take the lead in working with its citizens to develop management proposals to achieve stock rebuilding.

4.5.3.6 Periodic Review of Rebuilding Plans

Rebuilding plans will be reviewed periodically, but at least every two years, although the Council may propose revisions to an adopted rebuilding plan at any time. These reviews will take into account the goals and objectives listed in Section 4.5.3.1, recognizing that progress towards the first goal, to achieve the population size and structure that will support MSY within the specified time period, will only be evaluated on receipt of new information from the most recent stock assessment. ~~In evaluating progress towards achieving target biomass, the Council will use the standard identified in the rebuilding plan. When drafting a rebuilding plan one of the following standards, or a standard similar in kind to the following, may be chosen:~~

- ~~If the probability of achieving the target biomass within the maximum permissible time period (T_{MAX}) falls below 50% (the required minimum value), then progress will be considered inadequate.~~

- ~~If the probability of achieving the target biomass within the maximum permissible time period (T_{MAX}) falls below the value identified in the rebuilding plan, then progress will be considered inadequate.~~

The Council, in consultation with the SSC and GMT, will determine on a case-by-case basis whether there has been a significant change in a parameter such that the chosen management target must be revised. If, based on this review, the Council decides that the harvest control rule or target year must be changed, the procedures outlined in Section 4.5.3.3 will be followed. Regardless of the Council's schedule for reviewing overfished species rebuilding plans, the Secretary of Commerce, through NMFS, is required to review the progress of overfished species rebuilding plans toward rebuilding goals every two years, per Magnuson-Stevens Act at 16 U.S.C. §304(e)(7).

4.5.3.7 Precedence of a Recovery Plan or "No Jeopardy" Standard Issued Pursuant to the Endangered Species Act

Like rebuilding plans pursuant to National Standard 1 in the Magnuson-Stevens Act, a recovery plan pursuant to the Endangered Species Act outlines measures for the conservation and survival of the designated species. Under Section 7 of the Endangered Species Act an agency must consult NMFS when any activity permitted, funded, or conducted by that agency may affect a listed marine species or its designated critical habitat. (In the case of fishery management actions, NMFS is both the action and consulting agency.) As part of these consultations, a biological opinion is produced describing standards that must be met when permitting or implementing the action to ensure that the action is not likely to jeopardize the continued existence of the listed species; these are referred to as "no jeopardy" standards.

Measures under a recovery plan or "no jeopardy" standards in a biological opinion will supercede rebuilding plan measures and targets if they will result in the stock rebuilding to its target biomass by an earlier date than the target year identified in the current rebuilding plan. (If expressed probabilistically, any ESA standard expressed as a combination of date and probability that constitutes a higher standard will take precedence over the equivalent target and probability in the rebuilding plan. For example, an ESA standard requiring recovery by the rebuilding plan target year, but with a higher probability, would take precedence over the rebuilding plan.) If a stock is de-listed before reaching its target biomass, the rebuilding plan will come back into effect until such time as the stock is fully rebuilt.

4.5.4 Summary of Rebuilding Plan Contents

As noted in Section 4.5.3.3, this section summarizes the contents of rebuilding plans, including the values for rebuilding parameters, at the time of their adoption. The specified numerical values for these parameters are likely to change over time. This section will not be amended to incorporate any revised values. As described in Section 4.5.3.4, if the numerical specification of the harvest control rule or target year for a given overfished species is changed, the new value will be published in federal groundfish regulations. In addition, subsequent SAFE documents may include updated values for the parameters listed in Section 4.5.3.3 and Table 4-1.

In 1999, NMFS notified the Council that the coastwide lingcod stock was considered overfished. Amendment 16-2 to the FMP included a rebuilding plan for lingcod that set a T_{TARGET} rebuilding date of 2009. However, the lingcod stock rebuilt faster than the Council had initially anticipated. The 2005 lingcod stock assessment showed that the coastwide stock had rebuilt to a level exceeding statutory requirements, B_{MSY} or B_{40}. Amendment 16-4, therefore, removed the lingcod rebuilding plan from the FMP.

4.5.4.1 Darkblotched Rockfish

Status of the Darkblotched Stock and Fisheries Affected by Stock Rebuilding Measures at the Time of the Council's Rebuilding Plan Adoption (June 2003)

Historically, darkblotched rockfish were managed as part of a coastwide Sebastes complex, which was later segregated into north and south management units divided at 40°30' N latitude. As a result, fishery-dependent data from this period are generally unavailable. The first darkblotched rockfish stock assessment estimated the proxy MSY harvest rate and overfishing rate for the stock (Lenarz 1993).

Rogers et al. (2000) assessed darkblotched stock status in 2000 and determined the stock was at 14% to 31% of its unfished level. This range in biomass estimates encompasses the MSST threshold of 25%; uncertainty in past catches by foreign vessels, which targeted Pacific ocean perch and also caught darkblotched rockfish, was the most important contributor to this wide range for the biomass estimate. A larger unfished biomass (B_0) is computed using larger historic catch estimates. Since the MSST is expressed as a percent of unfished biomass, a larger B_0 increases the absolute value of this threshold, making an overfished determination more likely. Without definitive information on foreign catches, managers assumed darkblotched comprised 10% of this catch, leading to the conclusion that the spawning stock biomass was 22% of its unfished level. Because this is below the MSST, the stock was declared overfished in 2000.

The Council adopted a rebuilding plan for darkblotched rockfish at its June 2003 meeting, as described by the parameter values listed in Table 4-1. These values are based on a rebuilding analysis conducted by Methot and Rogers (2001).

Darkblotched rockfish occur on the outer continental shelf and continental slope, mainly north of Point Reyes. Because of this distribution they are caught exclusively by commercial vessels. Most landings have been made by bottom trawl vessels targeting flatfish on the continental shelf, rockfish on the continental slope, and the Dover sole–thornyhead–sablefish complex, also on the slope.

Methods Used to Calculate Stock Rebuilding Parameters

The methods used by Methot and Rogers in their rebuilding analysis do not differ substantially from the approach described in Section 4.5.2.

Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET} and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis used in formulating the rebuilding plan (Methot and Rogers 2001). The Council chose a value of 80% for P_{MAX}, based on a harvest control rule of F = 0.027. This results in a target year of 2030.

Darkblotched Rockfish Rebuilding Strategy

As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for darkblotched rockfish was a fishing mortality rate of 0.027. Based on the 2001 rebuilding analysis, this harvest rate is likely to rebuild the stock by the target year of 2030. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.

Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2003, at the time of rebuilding plan adoption, measures intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. (By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. This is the preferred habitat for some overfished species.)

Beginning in 2002 time/area closures, referred to as Groundfish Conservation Areas (GCAs), came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from log books and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.

To limit darkblotched rockfish bycatch, an outer boundary of the GCA was set to move fishing activity into deeper water, away from the depth range of higher abundance for this species. In 2003 this outer boundary was modified during the winter months to allow targeting of petrale sole and other flatfish in shallower depths while still minimizing bycatch. The cumulative trip limits for minor slope rockfish north of Cape Mendocino, the species complex that darkblotched rockfish are managed under, and for splitnose rockfish, a co-occurring target species, were also lowered. Trip limits for other target species also may be adjusted to reduce darkblotched rockfish bycatch.

4.5.4.2 Pacific Ocean Perch

Status of the Pacific Ocean Perch Stock and Fisheries Affected by Stock Rebuilding Measures at the Time of the Council's Rebuilding Plan Adoption (June 2003)

Pacific Ocean Perch (POP) were targeted by Soviet and Japanese factory trawlers between 1965 and 1975. Their large catches during this period substantially contributed to a decline in the West Coast stock. In 1981, just before this FMP was implemented, the Council declared the POP stock depleted and recommended conservative harvest policies. Although management measures discouraged targeting POP while allowing continued fishing on other species, the stock did not recover and the Council recommended still more restrictive measures. A 1998 stock assessment (Ianelli and Zimmerman 1998) estimated POP biomass was 13% of the unfished level, leading NMFS to declare the stock overfished in 1999.

The Council adopted a rebuilding plan for POP at its June 2003 meeting, as described by the parameter values listed in Table 4-1. These values are based on a 2000 stock assessment (Ianelli, *et al.* 2000) and subsequent rebuilding analysis (Punt and Ianelli 2001). A retrospective analysis of foreign fleet catches, underway at the time of rebuilding plan adoption, may change the rebuilding period estimates on which the rebuilding plan is based.

POP tend to occur at similar depths as darkblotched rockfish, although they have a more northerly geographic distribution. As a result, POP are caught in similar fisheries as darkblotched rockfish, but only north of Cape Mendocino. At the time the rebuilding plan was adopted, limited entry trawl vessels targeting flatfish, including petrale sole and arrowtooth flounder, accounted for more than 90% of all POP landings. POP are not an important component of the recreational fishery.

Methods Used to Calculate Stock Rebuilding Parameters

The methods used in the rebuilding analysis used to develop the rebuilding plan (Punt and Ianelli 2001) do not differ substantially from the approach described in Section 4.5.2.

Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET} and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis used in formulating the rebuilding plan (Punt and Ianelli 2001). The Council chose a value of 70% for P_{MAX}, based on a harvest control rule of F = 0.0082. This results in a target year of 2027.

Pacific Ocean Perch Rebuilding Strategy

As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for POP was a fishing mortality rate of 0.0082. Based on the 2001 POP rebuilding analysis (Punt and Ianelli 2001), this harvest rate is likely to rebuild the stock by the target year of 2027. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.

Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2003, at the time of rebuilding plan adoption, measures intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. (By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. This is the preferred habitat for some overfished species.)

Beginning in 2002 time/area closures, referred to as Groundfish Conservation Areas (GCAs), came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from log books and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.

Because POP tend to co-occur with darkblotched rockfish, management measures applicable to that species also serve to constrain catches of POP. These measures include configuring the outer boundary of the GCA so that vessels fish in deeper water, where POP are less abundant. A cumulative trip limit, which represents the maximum amount of an identified species or species group that may be landed within the cumulative limit period (in 2003, two months) is also established for this species. Trip limits for overfished species are intended to discourage targeting on them while permitting any incidental catch to be landed. (Bycatch discarded at sea is more difficult to monitor.) As with darkblotched rockfish, trip limits for target species also may be adjusted in order to minimize bycatch of overfished species.

4.5.4.3 Canary Rockfish

<u>Status of the Canary Rockfish Stock and Fisheries Affected by Stock Rebuilding Measures at the Time of the Council's Rebuilding Plan Adoption (June 2003)</u>

Canary rockfish exploitation began in the early 1940s when World War II increased demand for protein (Alverson, *et al.* 1964; Browning 1980). Through this decade the trawl fishery expanded in Oregon and Washington, accounting for most of the canary rockfish catch; in California longlines were mainly used to target rockfish during this period. Other gear historically used to catch canary rockfish include hook-and-line (primarily vertical longline), shrimp trawls, and pots and traps. From 1966 until 1976 foreign trawlers were responsible for most of the harvest. After passage of the Magnuson Act in 1977 domestic vessels became the dominant harvesters of this species. In recent years canary rockfish have become an important recreational target north of Cape Mendocino.

Overfishing, or exceeding the MFMT, was detected by a 1994 stock assessments and subsequent update (Sampson 1996; Sampson and Stewart 1994). In both cases the harvest rate exceeded the F20% threshold. In 1999 two age-based stock assessments showed that the stock was overfished in a northern area comprising the Columbia and U.S. Vancouver management zones (Crone, *et al.* 1999) and in a southern area comprising Conception, Monterey, and Eureka management zones (Williams, *et al.* 1999). Based on these assessments, the stock was declared overfished in January 2000.

The first rebuilding analysis (Methot 2000a) used results from the northern area assessment to project rates of potential stock recovery. The stock was found to have extremely low productivity, defined as production of recruits in excess of the level necessary to maintain the stock at its current low level. According to the anlaysis, rates of recovery are highly dependent on the level of recent recruitment, which could not be estimated with high certainty.

A subsequent assessment (Methot and Piner 2002c) treated the stock as a single coastwide unit (covering the area from the Monterey zone through the U.S. Vancouver zone). This differed from past assessments, where northern and southern areas were treated separately. The lack of older, mature females in surveys and other assessment indices was another consideration in this assessment. Older females may simply have a higher natural mortality rate, or survey and fishing gear may be less effective at catching them. If these fish are in fact un-sampled, productivity estimates should be higher because older, larger fish are more fecund. Methot and Piner (2002c) combined these two hypotheses in a single age-structured version of the SSC-endorsed stock synthesis assessment model (Methot 2000b). They estimated the 2002 abundance of canary rockfish coastwide was about 8% of B_0.

The Canary rockfish rebuilding plan was adopted by the Council at its June 2003 meeting and is based on a 2002 rebuilding analysis (Methot and Piner 2002a). The 2002 rebuilding analysis updated the first rebuilding analysis for canary rockfish, completed in 2000, using information from the aforementioned stock assessment. The Council's rebuilding strategy, when combined with the results of this rebuilding analysis, required a substantial reduction in the OY for 2003. As a result, fisheries must be managed for canary rockfish bycatch, often limiting the amount of target species that may be harvested.

Canary rockfish are encountered in a relatively wide variety of both commercial and recreational fisheries. However, limited entry trawlers targeting flatfish and arrowtooth flounder account for a large proportion of the landed catch, mainly north of Cape Mendocino. Much smaller amounts are caught in the whiting and DTS limited entry trawl fisheries, and by fixed gear vessels targeting groundfish on the continental shelf. Charter vessels account for most of recreationally-caught canary rockfish, mainly off of Northern California and Oregon.

Methods Used to Calculate Stock Rebuilding Parameters

The methods used in the rebuilding analysis used to develop the rebuilding plan (Methot and Piner 2002a) do not differ substantially from the approach described in Section 4.5.2.

Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET} and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis used in formulating the rebuilding plan (Methot and Piner 2002a). The Council chose a value of 60% for P_{MAX}, based on a harvest control rule of F = 0.022. This results in a target year of 2074.

Canary Rockfish Rebuilding Strategy

As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for canary rockfish was a fishing mortality rate of 0.022. Based on the 2002 canary rockfish rebuilding analysis (Methot and Piner 2002a), this harvest rate is likely to rebuild the stock by the target year of 2074. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.

Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2003, at the time of rebuilding plan adoption, measures intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. (By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. This is the preferred habitat for some overfished species.)

Beginning in 2002 time/area closures, referred to as Groundfish Conservation Areas (GCAs), came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from log books and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.

Canary rockfish prefer rocky areas on the continental shelf so management measures in use at the time of rebuilding plan adoption were intended to discourage fishing in these areas. Under the regulations in place during 2003, bottom trawling is prohibited in the GCA, which encompasses depth ranges where canary rockfish are most frequently caught. In addition, the aforementioned restrictions on the use of trawl nets equipped with large footropes discourage fishing in the rocky habitat preferred by this species. In areas shoreward of the GCA large footrope gear is prohibited, preventing trawlers from assessing rocky habitat in these shallower depths. In areas deeper than the GCA, either small or large footrope gear may be used, although large footrope gear is the preferred type in these depths. In addition, cumulative trip limits are structured to encourage vessels to fish exclusively in deep water where canary rockfish (as well as some other overfished species) are not encountered. Vessels are allowed to use all gear configurations during any given cumulative limit period (currently two months). However, vessels which use the small footrope configuration are restricted to lower cumulative trip limits than vessels using large footrope configurations. Since the large footrope configuration may only be used offshore of the GCA, these measures encourage fishing exclusively in deeper water to take advantage of the higher limits afforded this gear type.

Recreational fisheries are managed mainly through bag limits, size limits, and fishing seasons established for each West Coast state. Bag and size limits have been established for canary rockfish. In addition, managers have the option of closing areas to recreational fishing if needed to prevent the canary rockfish OY from being exceeded.

~~4.5.4.4 Lingcod~~

~~Status of the Lingcod Stock and Fisheries Affected by Stock Rebuilding Measures at the Time of the Council's Rebuilding Plan Adoption (June 2003)~~

~~A 1997 stock assessment concluded that the lingcod stock in the Columbia and Vancouver zones (including the Canadian portion of the Vancouver management zone) was less than 10% of B_0, below the B25% MSST (Jagielo, *et al.* 1997). The Council responded by imposing substantial harvest reductions coastwide, reducing the harvest targets for the Eureka, Monterey, and Conception areas by the same percentage as in the north. In 1999, scientists assessed the southern portion of the stock and concluded the condition of the southern stock was similar to the northern stock, thus confirming the Council had taken appropriate action to reduce harvest coastwide (Adams, *et al.* 1999). Based on these assessments,~~

~~the lingcod stock was declared overfished in 1999.~~

~~Subsequently, Jagielo (2000) conducted a coastwide lingcod assessment, which showed substantial increase in stock size and suggested that the stock was younger and more productive than previously thought. A revised rebuilding analysis of coastwide lingcod (Jagielo and Hastie 2001) was adopted by the Council in September 2001. It confirmed the major conclusions of the 2000 assessment and rebuilding analysis, but slightly modified recruitment projections to stay on the rebuilding trajectory that reaches target biomass in 2009. The rebuilding plan adopted by the Council at is June 2003 meeting is based on this 2001 update of the original rebuilding analysis produced by the same author. Because the minimum time period within which lingcod could be rebuilt is less than 10 years, the maximum allowable rebuilding period (T_{MAX}) is 10 years. The Council chose a target year equal to T_{MAX}, with the stock expected to rebuild by 2009.~~

~~Lingcod are encountered in a diverse array of commercial fisheries. Historically, limited entry trawl and limited entry fixed gear vessels accounted for the majority of lingcod landings. The open access sector, comprising many different gear types and fishing strategies, also lands a significant amount coastwide in nearshore and continental shelf areas. Lingcod are an important species in recreational fisheries, which account for an increasing portion of overall lingcod mortality as commercial landings declined drammatically beginning in 1998. Although recreational lingcod catches are reported coastwide, most of the recreational catch occurs off central and Northern California, with private boats making most of this catch.~~

~~Methods Used to Calculate Stock Rebuilding Parameters~~

~~The methods used in the rebuilding analysis used to develop the rebuilding plan (Jagielo and Hastie 2001) do not differ substantially from the approach described in Section 4.5.2.~~

~~Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption~~

~~Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET} and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis used in formulating the rebuilding plan (Jagielo and Hastie 2001). The Council chose a value of 60% for P_{MAX}, based on a harvest control rule of F = 0.0531 for the northern portion of the stock and F = 0.061 for the southern portion of the stock. This results in a target year of 2009.~~

~~Lingcod Rebuilding Strategy~~

~~As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for canary rockfish was a fishing mortality rate of 0.0531 for the northern portion of the stock and 0.061 for the southern portion of the stock. Based on the 2001 lingcod rebuilding analysis (Jagielo and Hastie 2001), this harvest rate is likely to rebuild the stock by the target year of 2009. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.~~

~~Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2003, at the time of rebuilding plan adoption, measures~~

~~intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. (By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. This is the preferred habitat for some overfished species.)~~

~~Beginning in 2002 time/area closures, referred to as Groundfish Conservation Areas (GCAs), came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from log books and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.~~

~~In addition to the more general measures described above, which are intended to reduce bycatch of all overfished species, lingcod landings by the limited entry fixed gear and open access sectors were prohibited during the winter months in 2003. Lingcod are more vulnerable in shallow depths (where vessels in these sectors are more likely to fish) during the winter because of their spawning behavior. For the same reason, retention of lingcod by recreational fishermen during winter months was prohibited in Washington and California during 2003. Recreational bag and size limits are also used to manage total lingcod fishing mortality.~~

4.5.4.~~5~~ 4 Bocaccio Rockfish

Status of the Bocaccio Stock and Fisheries Affected by Stock Rebuilding Measures at the Time of Rebuilding Plan Adoption (April 2004)

Assessment scientists and managers have treated West Coast bocaccio as independent stocks north and south of Cape Mendocino. The southern stock, which has been declared overfished, occurs south of Cape Mendocino and the northern stock north of 48° N latitude in northern Washington (off Cape Flattery). The overfished southern bocaccio rockfish stock occurs in Central and Southern California waters, on the continental shelf and in nearshore areas, often in rocky habitat. They are caught in both commercial and recreational fisheries in approximately equal amounts. Commercial catches mainly occur in limited entry trawl fisheries.

Bocaccio have long been an important component of California rockfish fisheries. Catches increased to high levels in the 1970s and early 1980s as relatively strong year-classes recruited to the stock. The Council began to recommend increasingly restrictive regulations after an assessment of the southern stock in 1990 (Bence and Hightower 1990) indicated that fishing rates were too high. The southern stock has been assessed six times (Bence and Hightower 1990; Bence and Rogers 1992; MacCall 2002; MacCall 2003b; MacCall, *et al.* 1999; Ralston, *et al.* 1996) and has suffered poor recruitment during the warm water conditions that have prevailed off Southern California since the late 1980s. The 1996 assessment (Ralston, *et al.* 1996) indicated the stock was in severe decline. NMFS formally declared the stock overfished in March 1999 after the groundfish FMP was amended to incorporate the tenets of the Sustainable Fisheries Act. MacCall et al. (1999) confirmed the overfished status of bocaccio and estimated spawning output of the southern stock to be 2.1% of its unfished biomass and 5.1% of the maximum sustainable yield (MSY) level. The northern stock of bocaccio has not been assessed.

While previous assessments only used data from Central and Northern California, an assessment in 2002 (MacCall and He 2002) also included data for southern California. While relative abundance increased slightly from the last assessment (4.8% of unfished biomass), potential productivity appears lower than previously thought, making for a more pessimistic outlook. The Council assumed a medium recruitment scenario for the 1999 year class, which was not assessed (MacCall, *et al.* 1999). The 2002 assessment revealed the 1999 year class experienced relatively lower recruitment. Therefore, although the 1999 year class contributed a substantial quantity of fish to the population, it did not contribute as much to rebuilding as was previously thought.

The 2003 bocaccio assessment differs greatly from the 2002 assessment. It is driven by the strength of the incoming 1999 year class that had not recruited into the indices used for the 2002 assessment and by a revised lower estimate of natural mortality (MacCall 2003b). In addition to the 2001 Triennial Survey data, the 2003 assessment used larval abundance data from recent CalCOFI surveys as well as length and catch per unit effort (CPUE) data from recreational fisheries. In calculating the recreational CPUE information, a new method was used that identifies relevant fishing trips by species composition and adjusts the catch history for regulatory changes that affect the level of discard and avoidance. The results of these calculations suggest that recreational CPUE has increased dramatically in recent years and is at a record high level in Central California north of Pt. Conception. The STAR Panel recommended the use of two assessment models as a means of bracketing uncertainty from the very different signals between the Triennial Survey and the recreational CPUE data. Following the Stock Assessment Review (STAR) Panel meeting, MacCall presented a third "hybrid" model that incorporated the data from all of the indices. The Scientific and Statistical Committee (SSC) recommended, and the Council approved, the use of this third modeling approach. This resulted in modest improvement in estimated stock size, but significantly affected the estimated productivity of the stock. These results had substantial effects on the rebuilding outlook for bocaccio which, under the 2002 assessment, was not expected to rebuild within T_{MAX} even with no fishing related mortality. Total mortality in 2003 fisheries was restricted to less than 20 mt as a means of conserving the stock while minimizing adverse socioeconomic impacts to communities. The current rebuilding analysis (MacCall 2003a), using the "hybrid" model, suggests the stock could rebuild to BMSY within 25 years while sustaining an optimum yield (OY) of approximately 300 mt in 2004.

The Council adopted a rebuilding plan for bocaccio rockfish at its April 2004 meeting, as described by the parameter values listed in Table 4-1. These values are based on a rebuilding analysis conducted by MacCall (2003b).

Fisheries in central and southern California are affected by the bocaccio rebuilding plan because the overfished population occurs in these waters. Recreational and limited entry trawl fisheries in this region have accounted for the bulk of landings in recent years.

Methods Used to Calculate Stock Rebuilding Parameters

The methods used by MacCall in his rebuilding analysis (MacCall 2003a) do not differ substantially from the approach described in Section 4.5.2.

Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET} and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis used in formulating the rebuilding plan (MacCall 2003a). Using the STATc base model from the most recent stock assessment (MacCall 2003b), the Council chose a value of 70% for P_{MAX}, based on a harvest control rule of F = 0.0498. This results in a target year of 2023.

Bocaccio Rockfish Rebuilding Strategy

As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for bocaccio rockfish was a fishing mortality rate of 0.0498. Based on the 2003 rebuilding analysis, this harvest rate is likely to rebuild the stock by the target year of 2023. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.

Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2004, at the time of rebuilding plan adoption, measures intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. (By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. This is the preferred habitat for some overfished species.)

Beginning in 2002, time/area closures known as GCAs came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from logbooks and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.

As noted, a large proportion of bocaccio catch occurs in recreational fisheries in Central and Southern California. Recreational depth closures, restricting fishing to shallow waters, bag limits, and seasonal closures have been used to reduce recreational bocaccio catches.

4.5.4.~~6~~5 Cowcod

Status of the Cowcod and Fisheries Affected by Stock Rebuilding Measures at the Time of Rebuilding Plan Adoption (April 2004)

Relatively little is known about cowcod, a species of large rockfish that ranges from Ranger Bank and Guadalupe Island in central Baja California to Usal, Mendocino County, California (Miller and Lea 1972), and may infrequently occur as far north as Newport, Oregon. Cowcod have been assessed only once (Butler, *et al.* 1999). Adult cowcod are primarily found over high relief rocky areas (Allen 1982). They are generally solitary, but occasionally aggregate (Love, *et al.* 1990).

While cowcod are not a major component of the groundfish fishery, they are highly desired by both recreational and commercial fishers because of their bright color and large size. In recent years small amounts have been caught by limited entry trawl vessels and recreational anglers in Southern California. The cowcod stock south of Cape Mendocino has experienced a long-term decline. The cowcod stock in the Conception area was assessed in 1998 (Butler, *et al.* 1999). Abundance indices decreased approximately tenfold between the 1960s and the 1990s, based on commercial passenger fishing vessel (CPFV) logs (Butler, *et al.* 1999). Recreational and commercial catch also declined substantially from peaks in the 1970s and 1980s, respectively.

B_0 was estimated to be 3,370 mt, and 1998 spawning biomass was estimated at 7% of B_0, well below the

25% overfishing threshold. As a result, NMFS declared cowcod in the Conception and Monterey management areas overfished in January 2000. Large areas off Southern California (the Cowcod Conservation Areas [CCAs]) have been closed to fishing for cowcod. The stock's low productivity and declined spawning biomass also necessitates an extended rebuilding period, estimated at 62 years with no fishing-related mortality (T_{MIN}), to achieve a 1,350 mt BMSY for the Conception management area.

There is relatively little information about the cowcod stock, and there are major uncertainties in the one assessment that has been conducted. The assessment authors needed to make estimates of early landings based on more recent data and reported total landings of rockfish. Age and size composition of catches are poorly sampled, population structure is unknown, and the assessment was restricted to Southern California waters.

A cowcod rebuilding review was completed in 2003, which validated the assumption that non-retention regulations and area closures have been effective in constraining cowcod fishing mortality (Butler, *et al.* 2003). These results, although encouraging, are based on cowcod fishery-related removals from CPFV observations and angler reported discards. Non-retention regulations and limited observation data have increased the need for fishery independent population indices.

The Council adopted a rebuilding plan for cowcod at its April 2004 meeting, as described by the parameter values listed in Table 4-1. These values are based on a rebuilding analysis conducted by Butler and Barnes (2000).

Methods Used to Calculate Stock Rebuilding Parameters

The Cowcod rebuilding analysis (Butler and Barnes 2000) was completed before the SSC default rebuilding analysis methodology (Punt 2002), described in Section 4.5.2 , had been developed. Instead, it uses a surplus production model using a log-normal distribution fitted to recruitment during 1951-1998. At the time of rebuilding plan adoption (2004) a new cowcod stock assessment and rebuilding analysis had not been completed. In April 2004 the SSC recommended that future cowcod stock assessments use a model whose output can be used in the default rebuilding analysis methodology.

Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET} and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis (Butler and Barnes 2000) used in formulating the rebuilding plan. The Council chose a value of 60% for P_{MAX}, based on a harvest control rule of F = 0.009. This results in a target year of 2090.

Cowcod Rebuilding Strategy

As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for cowcod was a fishing mortality rate of 0.009. Based on the 2000 cowcod rebuilding analysis (Butler and Barnes 2000), this harvest rate is likely to rebuild the stock by the target year of 2090. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.

Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2004, at the time of rebuilding plan adoption, measures intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. (By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. This is the preferred habitat for some overfished species.)

Beginning in 2002, time/area closures known as GCAs came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from logbooks and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.

Because cowcod is a fairly sedentary species, establishment of a marine protected area, considered one of the GCAs, is the key strategy for limiting cowcod fishing mortality. The CCAs in the Southern California Bight encompasses two areas of greatest cowcod density, as estimated in 2000, based on historical cowcod catch and catch rates in commercial and recreational fisheries. To aid in enforcement, the CCAs are bounded by straight lines enclosing simple polygons. Butler, et al. (2003) concluded that the CCAs have been effective in reducing bycatch to levels projected to allow stock rebuilding. Estimated fishery removals have been at levels sufficient to rebuild the stock, since the CCAs were implemented, except in 2001 when 5.6 mt was caught in the Conception management area. Most of this catch occurred in the spot prawn trawl fishery, which subsequently has been phased out.

Given the particular life history characteristics of cowcod, the Council will continue to use species-specific area closures to protect cowcod. As new information becomes available on cowcod behavior and fisheries interactions with cowcod, the boundaries or related regulations concerning the current CCAs may change, and additional CCAs may be established by regulation.

4.5.4.~~7~~ 6 Widow Rockfish

Status of the Widow Rockfish Stock and Fisheries Affected by Stock Rebuilding Measures at the Time of Rebuilding Plan Adoption (April 2004)

Widow rockfish are an important commercial species from British Columbia to central California, particularly since 1979, when an Oregon trawl fisherman demonstrated the ability to make large catches at night using midwater trawl gear. Since that time, many more participants entered the fishery and landings of widow rockfish increased rapidly (Love, *et al.* 2002). Because widow rockfish are commonly distributed in the mesopelagic (midwater) zone they are most commonly caught in with midwater trawl gear, which sweeps this zone (in contrast to bottom trawl gear used to target most groundfish species). Historically, widow rockfish were a major target species. Landings peaked at 12,473 mt in 1989 and as recently as 2000 stood at 3,866 mt (PFMC 2002). Target fisheries were eliminated after widow rockfish were declared overfished in 2001. Currently, the Pacific whiting fishery accounts for about three-quarters of widow rockfish catches; a small directed fishery for yellowtail rockfish, prosecuted by Washington treaty Indian Tribes, and the limited entry fixed gear sector account for almost all of the remaining incidental catches. Most catches occur in the U.S.-Vancouver, Columbia, and Eureka management areas.

Williams, et al. (2000) assessed the widow rockfish in 2000. The spawning output level (8,223 mt), based on that assessment and a revised rebuilding analysis (Punt and MacCall 2002) adopted by the Council in June 2001, was at 23.6% of the unfished level (33,490 mt) in 1999. This result was computed using the average recruitment from 1968 to 1979 multiplied by the spawning output-per-recruit at F = 0. The analysis concluded the rebuilding period in the absence of fishing is 22 years, and with a mean generation time of 16 years, the maximum allowable time to rebuild (T_{MAX}) is 38 years. Widow rockfish were declared overfished in 2001 based on these analyses.

The most recent assessment (He, *et al.* 2003b) concluded that the widow rockfish stock size is 22.4% of the unfished biomass, but indicates stock productivity is considerably lower than previously thought. Data sparseness was a significant problem in this widow rockfish assessment (Conser, *et al.* 2003; He, *et al.* 2003b). Limited logbook data prior to 1990 is available from bottom trawl fisheries, a questionable data source for a midwater species. The NMFS laboratory at Santa Cruz conducts a midwater trawl survey from which a juvenile index is derived. This index has been highly variable in its ability to predict recruitment, in part, due to the survey's limited geographical area relative to the overall distribution of widow rockfish. The widow rockfish rebuilding analysis considered a wide range of model formulations that investigated different hypothesis on natural mortality, stock-recruitment variability, and the use of a power coefficient to reduce variability of the Santa Cruz midwater juvenile survey. The SSC recommended model formulations that pre-specify the recruitment for 2003-2005, do not use a stock-recruitment relationship (recruits per spawner ratios were used instead to project future recruitment), and vary the power coefficient between two and four in the Santa Cruz midwater juvenile survey. The SSC did not recommend a power coefficient higher than four because the relationship between the Santa Cruz midwater survey recruitment index and other recruitment indices changed dramatically with higher powers. The previous rebuilding analysis (Punt and MacCall 2002) had used a power coefficient of 10 that dampened the estimate of recruitment variability and suggested much higher stock productivity.

Many of the rebuilding parameters for widow rockfish did not change dramatically with the new rebuilding analysis. The rebuilding period in the absence of fishing increased to 25 years and, with a mean generation time of 16 years; the maximum allowable time to rebuild (T_{MAX}) is 41 years. However, the harvest rate associated with different rebuilding strategies dropped significantly in response to the new understanding of decreased stock productivity. Thus, the interim rebuilding OY for 2003 using the 2000 rebuilding analysis was 832 mt, while in 2004, using the 2003 rebuilding analysis (He, *et al.* 2003a), the OY was 284 mt (using the base model, Model 8, which uses a power coefficient of three).

The Council adopted a rebuilding plan for widow rockfish at its April 2004 meeting, as described by the parameter values listed in Table 4-1. These values are based on a rebuilding analysis conducted by He, et al. (He, *et al.* 2003a).

Methods Used to Calculate Stock Rebuilding Parameters

The methods used in the rebuilding analysis He, et al. (He, *et al.* 2003a) used to develop the rebuilding plan do not differ substantially from the approach described in Section 4.5.2.

Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET}, and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis used in formulating the rebuilding plan (He, *et al.* 2003a). Using Model 8, the base model from the 2003 stock assessment (He, *et al.* 2003b), the Council chose a value of 60% for P_{MAX}, based on a harvest control rule of F = 0.0093. This results in a target year of 2038.

Widow Rockfish Rebuilding Strategy

As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for canary rockfish was a fishing mortality rate of 0.0093. Based on the 2003 widow rockfish rebuilding analysis (He, et al. 2003a), this harvest rate is likely to rebuild the stock by the target year of 2038. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.

Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2004, at the time of rebuilding plan adoption, measures intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. Because widow rockfish are mainly caught in the water column, bottom trawl gear restrictions have little effect on widow rockfish catch rates.

Beginning in 2002, time/area closures known as GCAs came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from logbooks and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.

Because widow rockfish occur in midwater and aggregate at night, elimination of target fishery opportunities is a relatively easy way of reducing widow rockfish bycatch. The Council has taken a policy approach of establishing management measures to reduce incidental catch in the Pacific whiting fishery sufficient to constrain total mortality below harvest levels (OYs) needed to rebuild the stock. At the time of rebuilding plan adoption, catch in other fisheries is sufficiently small so that rebuilding targets can be met without applying any special measures, beyond those needed to discourage targeting, to reduce widow rockfish fishing mortality in these fishery sectors.

Widow rockfish catches in recreational fisheries are relatively modest. Catches in this sector are managed mainly through bag limits, size limits, and fishing seasons established for each West Coast state. No recreational bag and size limits have been established for widow rockfish. However, general bag limits for rockfish may have some constraining effect on widow recreational catches.

4.5.4.~~8~~ 7 Yelloweye Rockfish

Status of the Yelloweye Rockfish Stock and Fisheries Affected by Stock Rebuilding Measures at the Time of Rebuilding Plan Adoption (April 2004)

Yelloweye rockfish are common from Central California northward to the Gulf of Alaska. They are bottom-dwelling, generally solitary, rocky reef fish, found either on or just over reefs (Eschmeyer, *et al.* 1983; Love 1991; Miller and Lea 1972; O'Connell and Funk 1986). Boulder areas in deep water (>180 m) are the most densely populated habitat type, and juveniles prefer shallow-zone broken-rock habitat

(O'Connell and Carlile 1993). They also reportedly occur around steep cliffs and offshore pinnacles (Rosenthal, *et al.* 1982). The presence of refuge spaces is an important factor affecting their occurrence (O'Connell and Carlile 1993). Yelloweye rockfish are potentially caught in a range of both commercial and recreational fisheries. Because of their preference for rocky habitat, they are more vulnerable to hook and line gear.

The first ever yelloweye rockfish stock assessment was conducted in 2001 (Wallace 2002). This assessment incorporated two area assessments: one from Northern California using CPUE indices constructed from Marine Recreational Fisheries Statistical Survey (MRFSS) sample data and California Department of Fish and Game (CDFG) data collected on board commercial passenger fishing vessels, and the other from Oregon using Oregon Department of Fish and Wildlife (ODFW) sampling data. The assessment concluded current yelloweye rockfish stock biomass is about 7% of unexploited biomass in Northern California and 13% of unexploited biomass in Oregon. The assessment revealed a thirty-year declining biomass trend in both areas with the last above average recruitment occurring in the late 1980s. The assessment's conclusion that yelloweye rockfish biomass was well below the 25% of unexploited biomass threshold for overfished stocks led to this stock being separated from the rockfish complexes in which it was previously listed. Until 2002, when yelloweye rockfish were declared overfished, they were listed in the "remaining rockfish" complex on the shelf in the Vancouver, Columbia, and Eureka management areas and the "other rockfish" complex on the shelf in the Monterey and Conception areas. As with the other overfished stocks, yelloweye rockfish harvest is now tracked separately.

In June 2002 the SSC recommended that managers should conduct a new assessment incorporating Washington catch and age data. This recommendation was based on evidence that the biomass distribution of yelloweye rockfish on the West Coast was centered in waters off Washington and that useable data from Washington were available. Based on that testimony, the Council recommended completing a new assessment in the summer of 2002, before a final decision was made on 2003 management measures. Methot et al. (2002b) did the assessment, which was reviewed by a STAR Panel in August 2002. The assessment result was much more optimistic than the one prepared by Wallace (2002), largely due to the incorporation of Washington fishery data. While the overfished status of the stock was confirmed (24% of unfished biomass), Methot et al. (2002b) provided evidence of higher stock productivity than originally assumed. The assessment also treated the stock as a coastwide assemblage. This assessment was reviewed and approved by the SSC and the Council at the September 2002 Council meeting. Methot and Piner (2002) prepared a rebuilding analysis based on this assessment.

The Council adopted a rebuilding plan for yelloweye rockfish at its April 2004 meeting, as described by the parameter values listed in Table 4-1. These values are based on a rebuilding analysis conducted by Methot and Piner (2002a).

Because yelloweye rockfish prefer rocky reef habitat on the continental shelf, they are most vulnerable to recreational and commercial fixed gear fisheries. In the past, the groundfish trawl sector has accounted for a large proportion of the catch: from 1990 to 1997 trawlers took an average of 46% of the catch coastwide (although most catches occur in Washington and Oregon waters). (This discussion is based on data in the table on page 3 of Methot, *et al.* 2003.) Trip limit reductions after 1997 and the imposition of restrictions on large footrope trawl gear in 2000 have substantially diminished the amount of yelloweye rockfish caught by the trawl sector. (Large footrope gear had made it possible for trawlers to access the rocky habitat where yelloweye live.) Trawl vessels accounted for only 14% of the catch on average from 1998 to 2001. Commercial fixed gear catches have also taken a significant share of the catch, 38% in the years 1990-1997. However, the implementation of the nontrawl RCA, which encloses much yelloweye habitat, has resulted in their share falling also. Open access directed groundfish fisheries and the Pacific halibut longline fleet also catch small amounts of yelloweye rockfish. Recreational catches have become more significant with the reduction in commercial catches. Comparing the 1990-1997 and 1998-2001 periods, their share of the total coastwide catch almost doubled to 30%, although actual average catches declined slightly. Most recreational catches occur in Washington State waters.

Methods Used to Calculate Stock Rebuilding Parameters

The methods used in the rebuilding analysis (Methot and Piner 2002a) used to develop the rebuilding plan do not differ substantially from the approach described in Section 4.5.2.

Rebuilding Parameter Values at the Time of Rebuilding Plan Adoption

Table 4-1 lists the numerical values for B_0, B_{MSY}, T_{MIN}, T_{MAX}, P_{MAX}, T_{TARGET}, and F. The values of B_0, B_{MSY}, T_{MIN}, and T_{MAX} are derived from the rebuilding analysis used in formulating the rebuilding plan (Methot and Piner 2002a). The Council chose a value of 80% for P_{MAX}, based on a harvest control rule of F = 0.0153. This results in a target year of 2058.

Yelloweye Rockfish Rebuilding Strategy

As shown in Table 4-1, at the inception of the rebuilding plan the harvest control rule for canary rockfish was a fishing mortality rate of 0.0153. Based on the 2002 rebuilding analysis (Methot and Piner 2002), this harvest rate is likely to rebuild the stock by the target year of 2058. This value is likely to change over time as stock size and structure changes. Any updated value will be published in federal groundfish regulations. The fishing mortality rate is applied to the exploitable biomass estimate to determine the OY for a given fishing period.

Management measures are implemented through the biennial harvest specification and management process described in Chapter 5. The types of management measures that may be implemented through this process are described in Chapter 6. In 2004, at the time of rebuilding plan adoption, measures intended to limit bycatch of overfished species included prohibiting retention of certain overfished species during some parts of the year, reducing landing limits (cumulative trip limits) on co-occurring species, establishing extensive time/area closures, and restricting the use of trawl nets equipped with large footropes. (By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. This is the preferred habitat for some overfished species.)

Beginning in 2002, time/area closures known as GCAs came into use as a way of decreasing bycatch of overfished species. GCAs enclose depth ranges where bycatch of overfished species is most likely to occur, based on information retrieved from logbooks and the at-sea observer program. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch.

In addition to the more general measures described above, which are intended to reduce bycatch of all overfished species, the Yelloweye Rockfish Conservation Area (YRCA), a C-shaped closed area off the Washington coast, near Cape Flattery, prevents recreational groundfish and halibut anglers from targeting this species in an area where they are concentrated. Recreational bag and size limits are also used to manage total yelloweye rockfish fishing mortality.

Given the particular life history characteristics of yelloweye rockfish, the Council will continue to use a species-specific area closure or closures to protect yelloweye rockfish. As new information becomes available on yelloweye rockfish behavior and fisheries interactions with yelloweye rockfish, the boundaries or related regulations concerning the current YRCA may change, and additional YRCAs may be established by regulation.

TABLE 4-1. Specified rebuilding plan parameters at the time of plan adoption. (Page 1 of 1).

Species	Year Stock Declared Overfished	Year Rebuilding Plan Adopted	B_0	B_{MSY}	T_{MIN}	T_{MAX}	P_{MAX}	T_{TARGET}	Harvest Control Rule
Darkblotched Rockfish	2000	2003	29,044 mt	11,618 mt	2014	2047	80%	2030	F = 0.027
Pacific Ocean Perch	1999	2003	60,212 units of spawning output	24,084 units of spawning output	2012	2042	70%	2027	F = 0.0082
Canary Rockfish	2000	2003	31,550 mt	12,620 mt	2057	2076	60%	2074	F = 0.022
~~**Lingcod**~~	~~1999~~	~~2003~~	~~28,882 mt N; 20,971 mt S~~	~~9,153 mt N;~~ ~~8,389 mt S~~	~~2007~~	~~2009~~	~~60%~~	~~2009~~	~~F = 0.0531 N;~~ ~~F = 0.061 S~~
Bocaccio*	1999	2004	13,387 B eggs in 2003	5,355 B eggs	2018	2032	70%	2023	F = 0.0498
Cowcod	2000	2004	3,367 mt	1,350 mt	2062	2099	60%	2090	F = 0.009
Widow Rockfish**	2001	2004	43,580 M eggs	17,432 M eggs	2026	2042	60%	2038	F= 0.0093
Yelloweye Rockfish	2002	2004	3,875 mt	1,550 mt	2027	2071	80%	2058	F= 0.0153

***Based on the STATc base model in MacCall (2003b).**

****Based on the Model 8 base model in He, *et al.* (He, *et al.* 2003b).**

[Amended: 11, 12, 16-1, 16-2, 16-3]

4.6 Determination of OY

Optimum yield (OY) is defined in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as the amount of fish which will provide the greatest overall benefit to the Nation. The Magnuson-Stevens Act also specifies that OY is based on maximum sustainable yield (MSY), and may be equal to or less than MSY. The fishery management plan (FMP) authorizes establishment of a numerical or non-numerical OY for any groundfish species or species group and lays out the procedures the Council will follow in determining appropriate numerical OY values. An OY may be specified for the fishery management area as a whole or for specific subareas. Numerical one-year OYs will be specified biennially, based on acceptable biological catches (ABCs) for major species or species groups, which are in turn based on quantitative or qualitative stock assessments. "Control rules" for determining the numerical values of OYs ensure they will not exceed the ABCs except under tightly limited conditions.

Most of the 80-plus species managed by the FMP have never been assessed in either a quantitative or qualitative manner. In some cases even basic catch statistics are unavailable, because many species (rockfish, for example) are not sorted unless specifically required by regulation. Species of this type have generally not been subject to numerical harvest limits, but rather harvest is limited by gear restrictions and market demand. Other management measures which determine the total amount of harvest each year include trip landing and frequency limits. Those species without a specified OY and not included in a multi-species OY will be included in a non-numerical OY, which is defined as all the fish that can be taken under the regulations, specifications, and management measures authorized by the FMP and promulgated by the U.S. Secretary of Commerce. This non-numerical OY is not a predetermined numerical value, but rather the harvest that results from regulations, specifications, and management measures as they are changed in response to changes in the resource and the fishery. In many cases, the absence of a numerical specification reflects the absence of basic management information, such as abundance estimates and catch statistics. The non-numerical OY concept allows for a variable amount of groundfish to be harvested annually, limited by such constraints as gear restrictions, management measures for other species, and/or absence of consumer acceptance or demand.

The close spatial relationship of many groundfish species throughout the management area results in commercial and recreational catches often consisting of mixtures of several species. This is especially the case in the trawl fishery where fishermen may target on one species, but unavoidably harvest several other species. In such cases, the optimum harvest strategy often is to target on a group (complex or assemblage) of groundfish species.

The Council will avoid allowing overfishing individual stocks and control harvest mortality to allow overfished stocks to rebuild to the MSY level. In the event the Council determines that greater long-term benefits will be gained from the groundfish fishery by overfishing individual stocks or by preventing a stock from recovering to its MSY level, it will justify the action in writing in accordance with the procedures and standards identified in this section and the National Standard Guidelines (50 CFR 600.310(d)). Conversely, the Council may determine that greater benefits will accrue from protecting an individual stock by constraining the multiple species complex or specific components of that complex.

Prior to implementation of the FMP in 1982, the states of Washington, Oregon, and California managed the groundfish fishery without the use of quotas. State regulations since the mid-1940s took the form of area closures (such as San Francisco Bay), legal gear definitions, minimum codend mesh regulations, size limits, bag limits, and other nonquota management measures. Implementation of the FMP built upon those historical management practices by increasing the level of catch monitoring, improving the assessment of stock conditions, and establishing other mechanisms for responding to management needs. It provides for continuation of the historical fishery on traditionally harvested groundfish species while allowing for the development of new fisheries for underutilized species. The FMP, as amended, provides for the establishment of resource conservation measures such as harvest guidelines or quotas through the annual specification procedure and annual and inseason management measures through the "points of concern" and socioeconomic framework mechanisms.

Reduction in catches or fishing rates for either precautionary or rebuilding purposes is an important component of converting values of ABC to values of OY. This relationship is specified by the harvest control rule. All OYs will remain in effect until revised, and, whether revised or not, will be announced at the beginning of the fishing period along with other specifications (see Chapter 5).

Groundfish stock assessments generally provide the following information to aid in determination of ABC and OY.

1. Current biomass (and reproductive potential) estimate.

2. FMSY or proxy, translated into exploitation rate.

3. Estimate of MSY biomass (BMSY), or proxy, unfished biomass (based on average recruitment), precautionary threshold, and/or overfished/rebuilding threshold.

4. Precision estimate (e.g., confidence interval) for current biomass estimate.

4.6.1 Determination of Numerical OYs If Stock Assessment Information Is Available (Category 1)

The Council will follow these steps in determining numerical OYs. The recommended numerical OY values will include any necessary adjustments to harvest mortality needed to rebuild any stock determined to be below its overfished/rebuilding threshold and may include adjustments to address uncertainty in the status of the stock.

1. ABC: Multiply the current fishable biomass estimate times the FMSY exploitation rate or its proxy to get ABC.

2. Precautionary adjustment: If the abundance is above the specified precautionary threshold, OY may be equal to or less than ABC. If current biomass estimate is less than the precautionary threshold (Section 4.4.1), the harvest rate will be reduced according to the harvest control rule specified in Section 4.5.1 in order to accelerate a return of abundance to optimal levels. If the abundance falls below the overfished/rebuilding threshold (Section 4.4.2), the harvest control rule will generally specify a greater reduction in exploitation as an interim management response toward rebuilding the stock while a formal rebuilding plan is being developed. The rebuilding plan will include a specific harvest control rule designed to rebuild the stock, and that control rule will be used in this stage of the determination of OY.

3. Uncertainty adjustments: In cases where there is a high degree of uncertainty about the biomass estimate and other parameters, OY may be further reduced accordingly.

4. Other adjustments to OY: Adjustments to OY for other social, economic, or ecological

considerations may be made. OY will be reduced for anticipated bycatch mortality (i.e. mortality of discarded fish). Amounts of fish harvested as compensation for private vessels participating in NMFS resource survey activities will also be deducted from ABC prior to setting OY.

5. OY recommendations will be consistent with established rebuilding plans and achievement of their goals and objectives.
   (a) In cases where overfishing is occurring, Council action will be sufficient to end overfishing.
   (b) In cases where a stock or stock complex is overfished, Council action will specify OY in a manner that complies with rebuilding plans developed in accordance with Section 4.5.2.
   (c) For fisheries managed under an international agreement, Council action must reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.
   (d) For any stock that has been declared overfished, the open access/limited entry allocation shares may be temporarily revised for the duration of the rebuilding period by amendment to the regulations in accordance with the normal allocation process described in this FMP. However, the Council may at any time recommend the shares specified in chapter 12 of this FMP be reinstated without requiring further analysis. Once reinstated, any change may be made only through the allocation process.
   (e) For any stock that has been declared overfished, any vessel with a limited entry permit may be prohibited from operating in the open access fishery when the limited entry fishery has been closed.

6. Adjustments to OY could include increasing OY above the default value up to the overfishing level as long as the management still allows achievement of established rebuilding goals and objectives. In limited circumstances, these adjustments could include increasing OY above the overfishing level as long as the harvest meets the standards of the mixed stock exception in the National Standard Guidelines:
   (a) The Council demonstrates by analysis that such action will result in long-term net benefits to the Nation.
   (b) The Council demonstrates by analysis that mitigating measures have been considered and that a similar level of long-term net benefits cannot be achieved by modifying fleet behavior, gear selection/ configuration, or other technical characteristic in a manner such that no overfishing would occur.
   (c) The resulting rate or level of fishing mortality will not cause any species or evolutionarily significant unit thereof to require protection under the Endangered Species Act.

7. For species complexes (such as Sebastes complex), the OY will generally be set equal to the sum of the individual component ABCs, HGs, and/or OYs, as appropriate.

4.6.2 Determination of a Numerical OY If ABC Is Based on Nonquantitative Assessment (Category 2)

1. ABC may be based on average of past landings, previous nonquantitative assessment, or other qualitative information.

2. Precautionary adjustments, if any, would be based on relevant information. In general, the Council will follow a risk-averse approach and may recommend an OY below ABC if there is a perception the stock is below its MSY biomass level. If a declining trend persists for more than

three years, then a focused evaluation of the status of the stock, its ABC, and the overfishing parameters will be quantified. If data are available, such an evaluation should be conducted at approximately five-year intervals even when negative trends are not apparent. In fact, many stocks are in need of re-evaluation to establish a baseline for monitoring of future trends. Whenever an evaluation indicates the stock may be declining and approaching an overfished state, then the Council should:

a. Recommend improved data collection for this species.

b. Determine the rebuilding rate that would increase the multispecies value of the fishery.

3. Uncertainty adjustment: In cases where there is a high degree of uncertainty about the condition of the stock or stocks, OY may be reduced accordingly.

4. Amounts of fish harvested as compensation for industry research activities will also be deducted.

5. These adjustments could include increasing OY above the default value as indicated for Category 1 stocks, items 5 and 6 above.

4.6.3 Non-numerical OY for Stocks with No ABC Values (Category 3)

Fish of these species are incidentally landed and usually are not listed separately in fish landing receipts. Information from fishery-independent surveys are often lacking for these stocks, because of their low abundance or they are not vulnerable to survey sampling gear. Until sufficient quantities of at-sea observer program data are available or surveys of other fish habitats are conducted and/or requirements that landings of all species be recorded separately, it is unlikely that there will be to sufficient data to upgrade the assessment capabilities or to evaluate the overfishing potential of these stocks.

These species typically may be included in a non-numerical OY that is defined as all the fish that can be taken under the regulations, specifications, and management measures authorized by the FMP and promulgated by the Secretary. Such an OY may not be a predetermined numerical value, but rather that harvest that results from regulations, specifications, and management measures as they are changed in response to changes in the resource and the fishery. Nothing in this FMP prevents inclusion of these species in a numerical OY if the Council believes that is more appropriate.

[Amended: 11, 16-1, 17]

5.0 PERIODIC SPECIFICATION AND APPORTIONMENT OF HARVEST LEVELS
6.0 MANAGEMENT MEASURES
7.0 ESSENTIAL FISH HABITAT
8.0 EXPERIMENTAL FISHERIES
9.0 SCIENTIFIC RESEARCH
10.0 PROCEDURE FOR REVIEWING STATE REGULATIONS
11.0 GROUNDFISH LIMITED ENTRY

Draft Amendment 16-4 proposes no changes to the remaining chapters of the FMP (Chapters 5-11,) except, when referring to the number of overfished species, to refer to there being seven, not eight, overfished groundfish species. For example, a sentence that reads "Six of the eight overfished species are continental shelf species…," would be revised to read "Five of the seven overfished species are continental shelf species…" This change is proposed in light of the 2005 recovery of the coastwide lingcod stock to above B_{40}.

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[**N.B. In the last published version of the FMP Chapter 13.0 was originally identified as References.** Chapter 11.0 was originally identified as Appendices. This material has been moved to two un-numbered sections at the end of the document and the remaining chapters after Chapter 10.0 have been re-numbered. Works cited in the Appendices are listed there.]

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APPENDICES CONTENTS

N.B. In the last published version of the FMP (July 1993) the Appendices appeared as Chapter 11.0, and have not been revised or updated since that time. This original material provides descriptive information on the following topics:

- Biological and Environmental Characteristics of the Resource
- Description of the Fishery
- Social and Economic Characteristics of the Fishery
- History of Management
- History of Research
- Weather-Related Vessel Safety
- Relationship of this FMP to Existing Laws and Policies
- Management and Enforcement Costs
- Groundfish Landings Data, 1981 - 1988 from PacFIN

References cited in the July 1993 version of Chapter 11.0 appear in Chapter 13.0 of that version of the FMP, which is entitled "References" and has not been revised or updated since that time.

A portion of Amendment 11 (1998) addressing Essential Fish Habitat added numbered Section 11.10 to the Appendices chapter of the FMP.

More detailed species accounts of groundfish EFH are compiled in the West Coast Groundfish Essential Fish Habitat Appendix, which is available on the NMFS Northwest Region website.1/

In summary, the FMP Appendices consist of the following material: Chapter 11.0 of the July 1993 version of the FMP, Section 11.10 added by FMP Amendment 11, the West Coast Essential Fish Habitat Appendix, and Chapter 13.0 of the July 1993 version. These materials are available under separate cover.

[1/]http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html

PROPOSED ACCEPTABLE BIOLOGICAL CATCH AND OPTIMUM YIELD SPECIFICATIONS AND MANAGEMENT MEASURES FOR THE 2007-2008 PACIFIC COAST GROUNDFISH FISHERY

AND

AMENDMENT 16-4: REBUILDING PLANS FOR SEVEN DEPLETED PACIFIC COAST GROUNDFISH SPECIES

PRELIMINARY DRAFT

ENVIRONMENTAL IMPACT STATEMENT
INCLUDING
REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

PREPARED BY
THE PACIFIC FISHERY MANAGEMENT COUNCIL
7700 NE AMBASSADOR PLACE, SUITE 200
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COVER SHEET
2007-2008 Groundfish Specifications and Management Measures
Amendment 16-4: Rebuilding Plans
Environmental Impact Statement

Proposed Action:	Specify harvest levels (acceptable biological catch and optimum yield values) for species and species complexes in the fishery management unit and establish management measures to constrain total fishing mortality to these specifications for the calendar years 2007-2008. Revise rebuilding plans for seven depleted groundfish species.
Type of Statement:	Final Environmental Impact Statement
For Further Information Contact:	
Mr. D. Robert Lohn Regional Administrator Telephone: (206) 526-6150 Fax: (206) 526-6426	National Marine Fisheries Service Northwest Region 7600 Sand Point Way NE, BIN C15700 Seattle, WA 98115-0070
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Abstract:
The *Pacific Coast Groundfish Fishery Management Plan* establishes a framework authorizing the range and type of measures that may be used to manage groundfish fisheries, enumerates 18 objectives that management measures must satisfy (organized under three broad goals), and describes more specific criteria for determining the level of harvest that will provide the greatest overall benefit to the nation, or optimum yield. Fisheries subject to management measures include limited entry trawl fisheries, limited entry fixed gear (pot and longline) fisheries, and a variety of other fisheries catching groundfish, either as target species or incidentally, but not license limited under the management framework established in the Groundfish Fishery Management Plan. Allocations to tribal fisheries off Washington State are also identified. Seven groundfish species are currently declared overfished and measures to prevent overfishing and rebuild these overfished stocks are a central element of this action. In addition, rebuilding plans for these species, which establish targets for long-term recovery, are re-evaluated and revised. The proposed action establishes harvest guidelines for groundfish species, species groups, and geographic subunits. In order to constrain fisheries to these harvest guidelines, management measures for commercial and recreational fisheries are identified. Management measures considered for commercial fisheries include two-month cumulative landing limits for species, species groups, and geographic subunits for limited entry trawl and fixed gear sectors, and fisheries not license limited under the *Pacific Coast Groundfish Fishery Management Plan*, and gear restrictions to reduce bycatch of overfished species and reduce habitat impacts. Management measures considered for recreational fisheries include bag limits, size limits, and fishing seasons; which vary by state. In addition, area closures based on depth and intended to reduce bycatch of species apply to both commercial and recreational fisheries that are likely to catch these species. These closures vary by geographic area and time of year.

Comments due by: .

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1.0 INTRODUCTION

1.1 How This Document is Organized

This document provides background information about, and analyses for two related actions. The first action is to establish 2007-2008 biennial harvest specifications and management measures for fisheries covered by the *Pacific Coast Groundfish Fishery Management Plan* (FMP), which are developed by the Pacific Fishery Management Council (hereafter, the Council) in collaboration with the National Marine Fisheries Service (NMFS). The second action is to consider revising rebuilding plans for seven depleted (overfished) groundfish species. This action requires a potential amendment to the groundfish FMP, which contains the current overfished species rebuilding plans. The two actions are related because the rebuilding plans determine the range of harvest levels that may be considered for depleted species. These actions must conform to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 nautical miles from shore. These actions must also conform to a recent court ruling in the Ninth Circuit Court of Appeals, which held that, among other things, the purpose of the MSA is to give conservation of fisheries priority over short-term economic interests. The Court interpreted the rebuilding requirements of the MSA as: 1) the rebuilding periods must be as short as possible; 2) short-term needs of fishing communities may be taken into account in setting rebuilding periods, even when the biology of the species dictates exceeding the 10-year statutory cap. As an example, the Court noted that in order to avoid disastrous short-term consequences, NMFS may set limited quotas that allow for some fishing of plentiful species, despite the inevitability of bycatch.

In addition to addressing MSA mandates, this document is an environmental impact statement (EIS), pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. According to NEPA (Sec. 102(2)(C)), any "major federal action significantly affecting the quality of the human environment" must be evaluated in an EIS. Based on a preliminary determination by Council and NMFS staff, implementing the two actions referenced above may have significant impacts. Therefore, rather than preparing an environmental assessment (EA), which provides "sufficient evidence and analysis for determining whether to prepare an environmental impact statement," NMFS and the Council have decided to proceed directly to preparation of an EIS. This document is organized so that it contains the analyses required under NEPA, the Regulatory Flexibility Act (RFA), and Executive Order (EO) 12866, which mandates an analysis similar to the RFA. For the sake of brevity, this document is referred to as an EIS, although it contains required elements of an Initial Regulatory Flexibility Analysis (IRFA) pursuant to the RFA and a Regulatory Impact Review (RIR) pursuant to EO 12866.

Federal regulations (40 CFR 1502.9) require agencies to prepare and circulate a draft EIS (DEIS), which "must fulfill and satisfy to the fullest extent possible the requirements established for final statements in Section 102(2)(C) of the Act" (i.e., NEPA). Federal regulations (40 CFR 1506.10(c)) and agency guidelines (NOAA Administrative Order 216-6.5.01.b.1(i)) stipulate a minimum 45-day public comment period on the DEIS. At the end of this period a final EIS (FEIS) is prepared, responding to comments and revising the document accordingly. After the EIS is completed, a 30-day "cooling off" period ensues before the responsible official may sign a record of decision (ROD) and implement the proposed action.

Environmental impact analyses have four essential components: a description of the purpose and need for the proposed action, a range of alternatives, including the proposed action, that represent different ways of accomplishing the purpose and need, a description of the human environment affected by the proposed action, and an evaluation of the predicted direct, indirect, and cumulative impacts of the alternatives.[1] (The human environment is interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment, 40 CFR 1508.14.) These elements allow the decision maker to look at different approaches to accomplishing a stated goal and understand the likely consequences of each choice or alternative. EISs are commonly organized around four chapters covering each of these topics. This EIS is organized differently; Chapters 1 and 2 cover the purpose and need for the action and describe the alternatives, and the next five chapters focus on parts of the biological, physical, and human environments potentially affected by the proposed action. These chapters describe both the status quo environment potentially affected by the proposed action and the predicted impacts of each of the alternatives. Based on this structure, the document is organized in 14 chapters:

The rest of this chapter, Chapter 1, discusses the reasons for federal regulation of West Coast groundfish fisheries in 2007-2008 and for considering revisions to established groundfish rebuilding plans. This description of purpose and need defines the scope of the subsequent analysis.

- Chapter 2 outlines different alternatives that have been considered to address the purpose and need. The Council will choose their preferred alternatives from among these alternatives. The preferred alternative covering revisions to the six rebuilding plans will be submitted to NMFS as an FMP amendment. The preferred alternative for harvest specifications and management measures provides the basis for establishing the regulations governing groundfish fisheries in 2007-2008.

- Chapter 3 describes West Coast marine ecosystems and essential fish habitat (EFH) potentially affected by the proposed action and discloses the predicted impacts of the alternatives on that segment of the physical and biological environment.

- Chapter 4 describes fish species affected by the proposed action and discloses the predicted impacts of the alternatives on that segment of the biological environment. These include target and non-target groundfish fishery management unit species and non-target, non-groundfish species.

- Chapter 5 describes protected species potentially affected by the proposed action and discloses the predicted impacts of the alternatives on that segment of the biological environment.

- Chapter 6 describes the fisheries management regime. Impacts, considered in terms of public sector costs, are evaluated in Chapter 7.

- Chapter 7 describes the socioeconomic environment, which includes commercial, tribal, and recreational fisheries and coastal communities in the action area and how they would be affected by the different alternatives.

- Chapter 8 addresses additional requirements of NEPA and implementing regulations, including the identification of any measures that will be implemented to mitigate significant impacts of the proposed action.

- Chapter 9 details how this amendment meets 10 National Standards set forth in the MSA (§301(a)) and Groundfish FMP goals and objectives.

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[1] Federal regulations at 40 CFR 1502 detail the required contents of an EIS. Although there are several additional components, this list is of the core elements.

- Chapter 10 provides information on those laws and EOs, in addition to the MSA and NEPA, that an action must be consistent with, and how this action has satisfied those mandates.

- Chapters 11 through 14 include required supporting information: the list of preparers, who received copies of the document, a glossary and acronym list, and the bibliography.

1.2 Purpose and Need for the Proposed Actions

The proposed actions fall within the management framework described in the Groundfish FMP, which enumerates 18 objectives that management measures must satisfy (organized under three broad goals), describes more specific criteria for determining the level of harvest that will provide the greatest overall benefit to the Nation (defined as optimum yield [OY]), and authorizes the range and type of measures that may be used to achieve OY. The management regime described in the Groundfish FMP is itself consistent with 10 National Standards described in the MSA. Harvest specifications (OYs) and management measures must be consistent with the goals, objectives, and management framework described in the Groundfish FMP.

1.2.1 The Proposed Actions

The Council's/NMFS' *proposed actions*, evaluated in this document, are:

1. Re-evaluate and revise, if necessary, adopted rebuilding plans for seven depleted (overfished) groundfish species, so that the rebuilding periods are as short as possible, taking into account the status and biology of the depleted species, and the socioeconomic needs of West Coast fishing communities, and the interaction of the depleted stocks within the marine ecosystem.

2. Specify acceptable biological catch (ABC) and OY values for species and species' complexes in the fishery management unit and establish management measures to constrain total fishing mortality to these specifications. These specifications and management measures will be established for calendar years 2007 and 2008, although they are considered within the context of past management and long-term sustainability of managed fish stocks.

The harvest specifications (OYs) established for 2007 and 2008 are in part determined by potential revisions to rebuilding plans, the first proposed action. Management measures are intended to keep total fishing mortality during each year within the OY established for that year. Specifications include new harvest levels for species with new stock assessments and projected harvest levels for species with stock assessments completed in prior years. Management measures may be modified during the biennial period, so total fishing mortality is constrained to the OYs identified in the preferred alternative. The environmental impacts of any such changes in management measures are expected to fall within the range of impacts evaluated in this EIS. Federally-managed Pacific groundfish fisheries occurring off the coasts of Washington, Oregon, and California (WOC) establish the geographic context for the proposed action.

1.2.2 Need (Problems for Resolution)

The proposed actions are needed because:

1. The Council's policies for rebuilding depleted groundfish species, as described in rebuilding plans, must be re-evaluated and potentially adjusted so that they are consistent with guidelines

pursuant to National Standard 1 (50 CFR 660.310) and a recent opinion rendered in the Ninth District Court in the matter of *Natural Resources Defense Council, Inc., and Oceana, Inc. vs. National Marine Fisheries Service, et al.*, 421 F.3d 872 (9th Cir.2005)..

2. Commercial and recreational harvests in 2007 and 2008 must be constrained to levels that will ensure groundfish stocks are maintained at, or restored to, sizes and structures that will produce the highest net benefit to the nation, while balancing environmental and social values.

1.2.3 Purposes of the Proposed Actions

The purposes of the actions are:

1. Rebuild depleted groundfish stocks to a size and structure capable of supporting MSY according to the requirements of the MSA. The MSA mandates rebuilding periods "be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem" (§304(e).)

2. Ensure Pacific Coast groundfish subject to federal management are harvested at OY during 2007 and 2008 and in a manner consistent with the aforementioned Groundfish FMP and National Standards Guidelines (NSGs) (50 CFR 600 Subpart D), using routine management tools available to the specifications and management measures process (FMP at 6.2.1, 50 CFR 660.323(b)). Chapter 10 of this EIS describes how the proposed action (preferred alternative) is consistent with the FMP and MSA.

1.3 Background

1.3.1 Revising Groundfish Rebuilding Plans

National Standard 1 Guidelines establish criteria for rebuilding depleted or overfished[2] stocks that the Council used when it adopted rebuilding plans for the eight groundfish stocks[3] the Secretary of Commerce had formally declared as overfished. One of these stocks, lingcod (*Ophiodon elongatus*) has been subsequently rebuilt to its MSY stock size; the remaining seven stocks still managed under Council rebuilding plans are: bocaccio (*Sebastes paucispinis*), canary rockfish (*S. pinniger*), cowcod (*S. levis*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), widow rockfish (*S. entomelas*), and yelloweye rockfish (*S. ruberrimus*). According to NSG 1, rebuilding should bring stocks back to a population size that can support MSY (B_{MSY}). In order to do this, a rebuilding plan must specify a target year (T_{TARGET}) based on the time required for the stock to reach B_{MSY}. This target is bounded by a lower limit (T_{MIN}) defined as the time needed for rebuilding in the absence of fishing (i.e., a zero fishing mortality rate, F = 0). T_{MIN} is the shortest possible rebuilding period given the stock's estimated productivity. According to NSG 1, rebuilding plans for stocks with a T_{MIN} less than

2 The MSA and NSGs use the term "overfished" to describe stocks whose biomass has fallen below the minimum stock size threshold (MSST), triggering a management response to rebuild the stock. However, the concept of an overfished stock, defined by biomass, is frequently confused with the concept of "overfishing," or a situation where the fishing mortality rate has exceeded a threshold, which, if sustained, could lead to the stock becoming overfished. In order to make a clearer distinction between these two concepts, in this document the term "depleted" is used to mean overfished, or a biomass level below the MSST.

3 Nine groundfish stocks were formally declared overfished by the Secretary of Commerce; however, one of those stocks, Pacific whiting, was subsequently found not overfished before the Council could recommend a rebuilding plan to the Secretary of Commerce.

10 years must have a target less than or equal to 10 years. If, as is the case with all of the groundfish stocks currently managed under Council rebuilding plans, the biology of a particular species dictates a T_{MIN} of 10 years or greater, then, again according to NSG 1, the maximum allowable rebuilding time, T_{MAX}, is the rebuilding time in the absence of fishing (T_{MIN}) plus "one mean generation time." Mean generation time is a measure of the time required for a female to produce a reproductively-active female offspring {Pielou, 1977 #653; and especially \Restrepo, 1998 #462} calculated as the mean age of the net maternity function (product of survivorship and fecundity at age). An important distinction is the difference between T_{MIN} and the shortest time to rebuild stocks currently managed under Council rebuilding plans. T_{MIN} is the shortest time to rebuild from the onset of the rebuilding plan or from the first year of a rebuilding plan, which is usually the year after the stock was declared overfished. T_{MIN} is therefore the median time predicted to attain the target spawning biomass (for West Coast groundfish stocks, this value is 40% of initial, unexploited biomass) with no fishing-related mortality from the first year of a rebuilding strategy. Over time, estimated T_{MIN} can vary based on assessment results that better inform the stock's growth rate and relative productivity. However, for the seven species managed under West Coast groundfish rebuilding plans, the shortest possible time to rebuild from this point forward is not T_{MIN}, since some harvest has been allowed under Council rebuilding plans. The shortest possible time to rebuild the stocks with rebuilding plans under consideration in Amendment 16-4 is $T_{F=0}$, which is the median time to rebuild the stock if all fishing-related mortality were eliminated beginning in 2007.

Because of the uncertainty surrounding stock assessments and future population trends (due, for example, to variable recruitment), the rebuilding period limits and the target need to be expressed probabilistically. In past years, the Council's approach at the outset of the rebuilding period had been to set T_{TARGET} so there was at least a 50% probability of achieving B_{MSY} within the T_{MAX}.[4]

Although this approach gave some flexibility for the Council to choose a target rebuilding year falling anywhere between the T_{MIN} and T_{MAX} by considering tradeoffs between biological and socioeconomic impacts, a recent Ninth Circuit Court of Appeals decision requires a reconsideration of this approach and emphasizes the need to rebuild stocks in as short a time as possible, taking into account: (1) the status and biology of the stocks, (2) the needs of fishing communities, and (3) interactions of depleted stocks within the marine ecosystem. The current action responds to this by reconsidering the targets and parameters in previously-established rebuilding plans with more emphasis placed on swift rebuilding.

Historically, the Council has focused on the first factor, noted above, and modified rebuilding periods to accommodate targeted fishing for healthy stocks that co-occur with depleted species. The depleted species' stock assessments and rebuilding analyses describe the status and biology of the stocks, and their anticipated rebuilding trajectories. Amendment 16-4, and groundfish harvest analyses in 2007 and beyond will include more analysis of the latter two factors.

This EIS, which includes an IRFA and an RIR, analyzes the connections between depleted species and fishing communities. Different fishery sectors rely on opportunities to fish for various healthy groundfish stocks, almost all of which occur in mixed stock complexes that include both healthy and depleted groundfish stocks. The EIS shows which fishing communities tend to be reliant on which sectors of the groundfish fishery, and whether those sectors encounter depleted stocks while targeting more healthy stocks. It reviews the effects of varying potential groundfish-related income on the duration of depleted stocks' rebuilding periods. For some stocks, a small sacrifice in near-term groundfish-related income may result in notable gains in the swiftness of the rebuilding period. For other stocks, large sacrifices in groundfish-related income could be required to gain even a few months

4 The use of a low bound 50% probability is not specified in regulations; it is the result of litigation (*Natural Resources Defense Council v. Daley*, April 25, 2000, U.S. Court of Appeals for the District of Columbia Circuit).

difference in rebuilding period durations.

Amendment 16-4 is also intended to better take into account the interactions of depleted stocks within the marine ecosystem. Amendment 19 to the FMP, approved in March 2006, addressed how all groundfish species interact within the marine ecosystem and essential fish habitat. For the action considered in this EIS, the more thorough communities-effects review has necessitated a closer look at how depleted stocks interact with target stocks and each other. Where the need to rebuild one depleted stock constrains the annual harvestable amount of a second depleted stock, the rebuilding period for the second stock will be constrained by the rebuilding needs of the first stock. This is a shift from past practices, where rebuilding periods were set for each species individually.

In addition, rebuilding plans also may have to be revised in response to new information about a stock. This new information is typically derived from stock assessments, which use the most recent available scientific information about a stock to estimate various characteristics of the stock relating to its size and productivity. These characteristics largely determine what portion of the stock can be harvested on an annual basis while maintaining the stock at, or rebuilding it to, B_{MSY}; this harvestable amount is the OY for a given stock. An important intermediate step in determining the OY for an overfished stock is the preparation of a rebuilding analysis. The rebuilding analysis, using information from the stock assessment, computes the values of the various parameters used to describe the rebuilding plan.

The rebuilding framework described in the FMP anticipates the likelihood that rebuilding plans will need revision in light of new information about stock characteristics. In order to alleviate the need for frequent FMP amendments, which describes the rebuilding plan for each depleted stock, the FMP states that two key rebuilding parameters, the target year and the harvest control rule (typically expressed as a fishing mortality rate, which is then translated into the harvestable amount, or OY) will be published in federal regulations. Upon receipt of new information that NMFS and the Council determine requires adjustment of these parameters, a regulatory amendment would be made to change the published values through a full rulemaking. The FMP would not normally be amended to update changes in the values of other parameters that are part of the rebuilding plan descriptions in the FMP. However, the Council has elected to pursue an FMP amendment (Amendment 16-4) in this case since they will be considering changes to all seven species' rebuilding plans, within the FMP at Section 4.5.

In considering potential alternatives to revise the seven groundfish rebuilding plans, this EIS used a two-step analysis to develop a range of "vertically-integrated" OY alternatives. First, the alternative OYs specified by the Council for each depleted species were analyzed individually to understand how each OY alternative, which corresponds to a longer-term mortality schedule defining the rebuilding strategy, affects the estimated duration of rebuilding (T_{TARGET}) and affects the various fisheries/fishing sectors. Second, the OY alternatives for each of the seven depleted species were analyzed "vertically", or across the different species, to better understand the interactions between the different rebuilding strategies for the overfished species, and the tradeoffs to the various fishing sectors and communities affected by alternative rebuilding plans. This vertical cross-species analysis of alternative OYs is important since future management regimes are most directly affected by the collective constraints of all rebuilding plans. Vertically integrated OY alternatives are strategically developed by comparing and contrasting relatively higher and lower OY alternatives for each species in turn. This analytical treatment is designed to show, to the extent practicable, how each stock under rebuilding might differentially constrain fishing opportunities by fishing sector, area, and time. Guidance from the Council and the Council's Groundfish Allocation Committee is to assume a status quo management regime (i.e., continuance of similar depth-based closed areas specific to each fishing sector (RCAs), similar intersector allocations of groundfish species, etc.) as a primary working assumption in these analyses. However, the status quo management regime is significantly perturbed under some of these OY scenarios. In these cases, alternative management regimes result and examples are presented under different base assumptions.

1.3.2 The Process for Establishing Harvest Specifications (OYs) and Management Measures

In accordance with the Groundfish FMP, beginning in 1990 the Council set Pacific Coast groundfish harvest specifications annually, with harvest specifications and management measures in effect for the calendar year January 1 to December 31. Amendment 17 to the Groundfish FMP, approved in 2003, shifted decision-making to a two-year, or biennial, cycle. Under the biennial management cycle, harvest specifications and management measures are established for the two-year period in advance of the biennium. Separate ABCs and OYs are established for each calendar year in the two-year cycle. The first biennial harvest specifications were established for 2005–2006; the current action represents the second round of biennial specifications.

Council decision-making for this action occurs over three meetings, culminating in June of the year preceding the biennium. For the 2007-2008 biennium, the Council identified a preliminary range of ABCs and OYs at their November 2005 meeting; at their April 2006 meeting they selected preferred alternatives for the rebuilding plan revisions and, directly related to that, preferred ABCs and OYs that will be used as harvest limits during the 2007-2008 period. At this meeting the Council also approved a range of management measures' alternatives for analysis. The final decision point for the Council occurs at their June 2006 meeting when they finalize the full package of harvest specifications and management measures, choosing a preferred suite of management measures for 2007-2008.

Although Council decision-making is complete by June 2006, there are additional opportunities for public comment under NEPA and the rulemaking process. A DEIS will be released for public review and comment after the June Council meeting. Shortly thereafter, NMFS will publish a proposed rule to implement the 2007-2008 harvest specifications and management measures and Amendment 16-4, which will also include a public comment period. Changes to the rebuilding plans, which would be made via Amendment 16-4 to the groundfish FMP, will also be submitted to NMFS for Secretarial review. Subsequent to the public review periods on the proposed rule and on Amendment 16-4 itself, the approved changes to rebuilding plans will then be incorporated into the FMP. NMFS anticipates completing the Amendment 16-4 Secretarial review period in advance of implementing the 2007-2008 groundfish harvest specifications and management measures.

The choice of harvest specifications and the development of management measures are two separate sets of alternatives, which form the basis of the impact analysis. The OYs for 19 stocks or stock complexes differ among the harvest specification action alternatives. OYs for the remaining stocks are the same across all the action alternatives. (The No Action Alternative represents the status quo, or re-application of 2005-2006 harvest specifications. OYs for additional stocks are different under No Action in comparison to the action alternatives.) The differences among the harvest specification action alternatives reflect policy decisions based on various factors, such as scientific uncertainty in stock assessments (e.g., petrale sole), requirements of rebuilding plans, and whether to apply a precautionary reduction for stocks co-occurring with depleted species (e.g., chilipepper rockfish), among other factors.

The Council process for setting groundfish harvest specifications depends on periodic assessments of the status of groundfish stocks, rebuilding analyses of those stocks that are depleted and managed under rebuilding plans, and a report from an established assessment review body or a Stock Assessment Review (STAR) panel. As appropriate, the Council's Scientific and Statistical Committee (SSC) recommends the best available science for groundfish management decision-making in the Council process. The SSC reviews new assessments, rebuilding analyses, and STAR panel reports and recommends the data and analyses that should be used to set groundfish harvest levels and other specifications for the following biennial management period. A total of 23 groundfish stock assessments were conducted and approved in support of the process for setting 2007-2008 groundfish harvest specifications and management measures. This includes the 2005 Pacific whiting assessment, which was used to set 2005 harvest specifications and management measures for trawl fisheries targeting this stock. The 2005 assessment also forms the basis for ranging 2007-2008 Pacific whiting ABC/OY alternatives for analysis, primarily to understand the bycatch implications of potential future fisheries targeting Pacific whiting. However, new annual assessments of the West Coast Pacific whiting stock are anticipated for setting future Pacific whiting harvest specifications and management measures. The remaining 22 groundfish stock assessments conducted in 2005 are explicitly used for deciding 2007 and 2008 harvest specifications and management measures. An overview of the status of groundfish stocks and stock complexes is found in Chapter 4. How results from each of the current and past stock assessments are used to decide new harvest specifications is also discussed in Chapter 4.

1.3.3 The Range of Management Measures Considered by the Council

Management measure alternatives combine different management tools available to the Council and NMFS as specified in the FMP and in federal regulations. Each of these management measure alternatives (except for No Action) is intended to constrain fishing mortality to or below the Council-preferred OY levels determined by the choice among the ABC/OY alternatives mentioned above. (The action alternatives were crafted before performing the detailed analysis necessary to determine total fishing mortality for each stock. Therefore, one or more of the action alternatives may be projected to exceed the Council-preferred OY for one or more stocks. However, the Council-preferred alternative, chosen at the June Council meeting, must be projected to keep total fishing mortality for all stocks within their respective OYs.) This approach also makes it possible to compare the performance of alternative management measures against one standard: the Council-preferred ABC/OY levels chosen from the first set of alternatives.

The types of management measures included in the alternatives are likely to be substantially the same as those used during the 2005-2006 biennium, although their application will change so that they are suitable to available 2007-2008 harvest levels. Those which may be considered for modification include:

- Two-month or monthly cumulative landing limits frequently referred to as “trip limits.” These are separately established for the limited entry trawl sector, and the limited entry fixed gear and open access sectors.[5] Cumulative limits are established for species or species groups and specify an amount, by weight which a vessel may land during a two-month or monthly period.

- Gear requirements, principally relating to trawl gear. Since 2001 footrope restrictions have been in place for limited entry trawl gear. Footrope size limits the type of bottom habitat a trawl gear may operate in; trawlers with small footrope gear cannot operate in rocky areas, important habitat for some depleted groundfish. After extensive testing, beginning in 2005 selective flatfish trawl gear was required in the area shoreward of the trawl RCA in waters north of a management line at 40°10' N latitude (near Cape Mendocino, California). This modified bottom trawl gear reduces bycatch of most depleted rockfish species while maintaining or increasing catch efficiency for target flatfish species. (The modified trawl nets use a cutback headrope, which allows some species, including some rockfish species, to swim upward when disturbed, thus evading the net entrance. Bottom-hugging species like flatfish are still caught.)

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[5] These sectors are defined by the requirement to possess a gear-endorsed limited entry permit, which is required to engage in specified types of groundfish fisheries. The “open access” sector refers to those vessels targeting or incidentally catching groundfish without a limited entry permit, although they may hold permits required for other federally- or state-managed fisheries.

- For recreational gear, size limits and bag limits. Bag limits are a number of fish, sometimes enumerated by type, that an angler may retain or land on a per-trip basis. Recreational measures are principally administered by state governments since most of this fishing occurs within state waters. Through the Council process, state-specific measures are developed. Bag limits may differ by zone or management subareas established by the states.

- Time/area closures for commercial vessels, particularly Rockfish Conservation Areas (RCAs). RCAs have been in place since 2002 to prohibit vessels from fishing in depths where depleted groundfish species are more abundant. Separate RCAs are established for the limited entry trawl and non-trawl (limited entry fixed gear and open access) sectors. RCAs for recreational vessels have been in place since 2004. For both commercial and recreational fisheries, RCAs are intended to reduce the incidental catch of these species. Their boundaries may vary seasonally and may be re-specified as part of the biennial management process. In both commercial and recreational fisheries, time/area closures may include seasons of varying durations. Amendment 18 to the FMP, under Secretarial review, specified that depth-based management measures, like RCAs, could also be used either to prevent overfishing a healthy groundfish stock and/or to constrain incidental catch of protected species other than groundfish (salmon, halibut, Dungeness crab.)

1.3.4 Key Management Issues in 2007 and 2008

Certain depleted species will continue to constrain harvest opportunities for healthier stocks. Harvest limits for depleted stocks may change dramatically and constrain fisheries by gear, time, or area much differently than in the recent past, depending on revisions to species' rebuilding plans. In response, various combinations of sector-specific trip limits and closed area configurations will be a central management feature. The most recent available fishery observer data will be used to adjust the bycatch rates used in modeling projected total fishing mortality. Although preventing overfishing and rebuilding depleted stocks is a paramount concern, management measures are intended to allow fishers access to healthy stocks by reducing bycatch rates. This addresses competing goals in the Groundfish FMP to maximize the value of the groundfish resource and rebuild overfished stocks. Striking this balance between conservation of and direct social benefit from groundfish is another way to understand the purpose of this action.

Inseason management of California recreational fisheries to constrain mortality of depleted groundfish and stay within other harvest allocations made to that sector will again play an important role in the formulation of management measures for the 2007-2008 period. Data from a new recreational catch estimation program, the California Recreational Fisheries Survey (CRFS), will be used in preseason and inseason recreational harvest projections. Since CRFS has only been used since 2004, only two years of catch estimates are incorporated in the California recreational impact model used to project harvests for this fishery.

As mentioned above, regionalizing recreational fisheries management will continue as an important management tool. Historically, the recreational fisheries have had some degree of regional management based on differing state regulations and the geographic distribution of groundfish stocks caught in the sport fishery. For 2007-2008, the Council, along with the states, is now considering more explicit regional allocations in the form of harvest guidelines or targets. The concern that a given sector or region could harvest a disproportionate share of the very low coastwide OYs for certain depleted groundfish, such as canary rockfish, has sparked this discussion.

Two large areas in the Southern California Bight south of Pt. Conception have been closed to bottom fishing since 2000 to minimize mortality of cowcod, a severely depleted groundfish stock under rebuilding. Termed the Cowcod Conservation Areas (CCAs), these areas are bounded with regular, rectangular lines to ease enforcement of fishing prohibitions. Some members of the fishing industry have asked that the boundaries of the CCAs be modified to allow fishing in areas that are not considered cowcod habitat, but where healthy slope species, such as blackgill rockfish, are more abundant. The Council agreed to consider modifying the CCAs. This EIS analyzes alternative CCA boundaries with respect to cowcod conservation needs and enforceability of fishing prohibitions.

Successful rebuilding of the coastwide lingcod stock has prompted consideration for higher trip and bag limits by commercial and recreational fishing interests. This EIS analyzes the effect of higher lingcod harvest limits in 2007 and 2008 with respect to the estimated bycatch of co-occurring rockfish species (with particular concern for the bycatch of depleted species) and the potential of localized depletion of lingcod in some areas south of Cape Mendocino, California where the stock is less abundant. One proposal by the Washington Trollers Association, that the Council agreed to consider, is to allow a landing limit of lingcod by salmon trollers who are exempt from RCA restrictions. The potential risks and benefits of this proposal are analyzed in this EIS.

Salmon bycatch in directed groundfish fisheries will receive a greater focus in this EIS than in the past. An ESA consultation is required for determining salmon bycatch limits in groundfish fisheries, particularly in directed Pacific whiting fisheries where there is a salmon bycatch of any significance (relative to other directed groundfish fisheries). Chinook salmon bycatch limits were exceeded in the 2005 whiting fishery prompting a re-initiation of ESA consultation. That experience, a more pessimistic outlook for future salmon returns, and a greater federal focus on the role of harvest in salmon recovery compels a closer look at salmon bycatch in this EIS.

Constraining environmental impacts in West Coast open access fisheries has become increasingly difficult with the small OYs in place for some depleted stocks under rebuilding. As an example, in 2005 a large factory longliner announced plans to target spiny dogfish in the unlimited open access fishery in waters off Washington. This proposed fishery threatened the balance of intersector allocations for species such as canary and yelloweye rockfish, which could have led to an early exceedance of OYs and early termination/cancellation of planned fishing activities across all sectors. In response, NMFS adopted emergency annual bycatch caps (or total mortality limits) for canary and yelloweye rockfish for all open access fisheries in 2005, which would have conceivably limited early closures to only that sector had bycatch exceeded those limits. While the proposed dogfish longline fishery did not occur, this does serve as an example of the difficulty of limiting participation and impacts in the open access fishery. Small limits alone may not adequately control this fishery, which is why this fishery needs more scrutiny in this EIS.

An implication of managing for lower OYs under some of the alternative harvest specifications analyzed in this EIS is the potential need to further constrain tribal groundfish fisheries. Ad hoc tribal/non-tribal allocations[6] under the status quo management regime have been worked out in the Council process. However, some of the lower OY alternatives for northern depleted species, such as canary and yelloweye rockfish, may prompt formal government to government negotiations in the ongoing *U.S. vs. Washington* district court venue to resolve how allowable harvests will be allocated between tribal and non-tribal fisheries, as well as how to effectively constrain tribal fisheries to stay within whatever allocations are ultimately decided. This is an added step in the process of deciding

[6] Ad hoc tribal/non-tribal allocations exist for the depleted species and many target groundfish species. However, such allocations do not include those for sablefish and Pacific whiting, which are long-term allocations frameworked in the Groundfish FMP and specified in federal regulations.

revised rebuilding plans under Amendment 16-4 and the 2007-2008 harvest specifications and management measures. It is unclear how any delay in this allocation decision, if it occurs in the more formal *U.S. vs. Washington* process, will affect final decisions on the actions contemplated in this EIS.

1.3.5 Changes to the FMP Affecting Annual Management

In 2005 the Council took final action on two amendments to the groundfish FMP that will affect management in the 2007-2008 seasons. Amendment 18 incorporates into the FMP the preferred alternative in the September 2004 Pacific Coast Groundfish Fishery Management Plan Bycatch Mitigation Program Final Environmental Impact Statement {NMFS, 2004 1074 /id}. The preferred alternative from that EIS includes the use of sector-specific total catch limits as a way of motivating fishery participants to reduce bycatch, especially of depleted groundfish species. The Council has already used total catch limits in certain circumstances, such as the at-sea whiting sector, where real-time monitoring systems are sufficient to make this approach workable. The amendment would also reorganize and update some of the chapters in the FMP to better describe the current management framework. This includes a description of current standardized bycatch monitoring methodologies and other measures for bycatch reduction. Amendment 19 incorporates the preferred alternative adopted by the Council for the identification and mitigation of essential fish habitat in a FEIS prepared by NMFS {NMFS, 2005 1073 /id}. Mitigation measures will have a direct effect on management in the 2007-2008 cycle. These measures include 43 areas closed to bottom trawling in waters off of all three West Coast states and 17 areas off of Oregon and California closed to all bottom-contact gear. Furthermore, all waters deeper than 700 fathoms would be closed to bottom trawling. An existing measure prohibiting the use of large footrope trawl gear shoreward of a line approximating the 100 fm depth contour; footrope gear larger than 19 inches is prohibited, as is dredge and beam trawl gear. NMFS approval of these amendments, along with implementation of any related regulations is expected to occur in advance of the 2007-2008 season.

1.4 Scoping Summary

1.4.1 Background to Scoping

According to the NEPA, the public and other agencies must be involved in the decision-making process for agency actions. “Scoping” is an important part of this process. Scoping is designed to provide interested citizens, government officials, and tribes an opportunity to help define the range of issues and alternatives that should be evaluated in the EIS. NEPA regulations stress that agencies should provide public notice of NEPA-related proceedings and hold public hearings whenever appropriate during EIS development (40 CFR 1506.6).

The scoping process is designed to ensure all significant issues are properly identified and fully addressed during the course of the EIS process. The main objectives of the scoping process are to provide stakeholders with a basic understanding of the proposed action; explain where to find additional information about the project; provide a framework for the public to ask questions, raise concerns, identify issues, and recommend options other than those being considered by the agency conducting the scoping; and ensure those concerns are included within the scope of the EIS.

1.4.2 Council and Agency NEPA Scoping

On October 25, 2005 (70 FR 61595), NMFS and the Council published a Notice of Intent (NOI) in the *Federal Register* announcing their intent to prepare an EIS in accordance with NEPA for the 2007-2008

ABC and OY specifications and management measures for the Pacific Coast groundfish fishery.[7] The NOI described the proposed action and the way in which alternatives to be analyzed in the EIS would be formulated; it also enumerated a preliminary list of potentially significant impacts that could result from implementing the proposed action. A period for accepting written public comments on the scope of the EIS ended on November 25, 2005, as announced in the NOI.

The Council process, which is based on stakeholder involvement and allows for public participation and public comment on fishery management proposals during Council, subcommittee, and advisory body meetings, is the principal mechanism to scope the EIS. The advisory bodies involved in groundfish management include the Groundfish Management Team (GMT), with representation from state, federal, and tribal fishery scientists; and the Groundfish Advisory Subpanel (GAP), whose members are drawn from the commercial, tribal, and recreational fisheries, fish processors, and environmental advocacy organizations. The Ad Hoc Allocation Committee, a subpanel of the whole Council, provides advice on allocating harvest opportunity among the various fishery sectors. Meetings of the Council and its advisory bodies constitute the Council scoping process, involving the development of alternatives and consideration of the impacts of the alternatives.

The Council and its advisory bodies considered 2007-2008 specifications and management measures at four meetings in November 2005, March 2006, April 2006, and June 2006. The Ad Hoc Groundfish Allocation Committee and the GMT met on February 6–9, 2006, to review the range of harvest specifications and provide guidance on allocation of harvest opportunity among different fishery sectors for 2007-2008. When the Council considers groundfish management at their meetings, the GMT and GAP provide advice and guidance on the development of harvest specifications and management measures. The GMT also meets outside of Council meetings to develop management recommendations. For the 2005-2006 harvest specifications process, they met in October 2003, and February, May, and June 2004. All these meetings are open to the public and are duly noticed.

In addition, both the Oregon and California state fish and game departments hold public hearings to solicit input on the formulation of management measures. Comments made at these hearings are summarized and will be made available to the Council in advance of their June 2006 meeting.

1.4.3 Summary of Comments Received

To gauge public attitudes toward the effects of management on fishing communities, all written and oral public comment on inseason management and inseason adjustments between March 2002 and April 2006 were reviewed. Any comments relating to communities were excerpted in Table 1-1. (Most oral comments were recorded in handwritten notes by staff officers during Council meetings, although some were transcribed from tapes of the meetings). In addition, the table includes comments summarized for the 2004 and 2005/2006 groundfish annual specifications environmental impact statements.

The text below merely summarizes comments made, and makes no claims as to their validity. *[Note that some 2002 comments may be missing]*.
Many comments referred to specific geographic locations. Those are summarized below, from north to south. Comments that did not specifically refer to geographic locations are not included in the summary immediately below, but are summarized later in this section.

[7] On March 14, 2006, an amended NOI was published to include revision of rebuilding plans as part of the proposed actions (71 FR 13097).

1.4.3.1 Washington Comments

Northern Washington

Comments from 12 different people referred to northern Washington communities, including Bellingham, Forks, LaPush, Neah Bay, Port Angeles, Sammamish and Westport. The comments are summarized here.

- A Bellingham processor was concerned about the effect of potentially moving a management line to 150 fathoms (April 2004). He was concerned that this depth restriction would eliminate or sharply reduce the harvest of dogfish and the setline blackcod fishery, resulting in economic hardship.
- Recreational fishers in LaPush were concerned about the lack of regional management in relation to a potential closure of groundfish fisheries. They noted "Groundfish fisheries are critically important to our coastal economy and tourism." (April 2004)
- Recreational fishers from Neah Bay noted that the community had invested heavily in a new marina and other facilities that were dependent on recreational fisheries. (April 2004)
- Recreational CPFV businesses in Westport called for regional management of fisheries and said they depended upon groundfish and halibut for a major part of their livelihood. (April 2004). Recreational interests emphasized that a phased-in approach to cuts in yelloweye quotas would be less damaging to the community than immediate cuts (March and April 2006).
- Commercial fishers from Neah Bay were concerned that their small boat fishery was being discriminated against, as small boats could only fish during certain seasons due to safety concerns. They emphasized the importance of the small trawl fishery to local communities and expressed frustration at the delay in making management decisions. They noted "We have already lost so much with the cable crossing, the Vessel Traffic Lane Change, and other inseason adjustments that we have no reserves left to fall back on…." And that "many of us have been fishing our small family boats for generations. But sadly, many of us do not encourage our children to partake of our tradition of being a fisherman...competition and politics have put an end to that dream" (June 2002 and June 2003). In April 2006, a recreational representative voiced support for a phased-in approach to closures.
- The mayor of Forks, Washington and the Quileute Tribe both wrote to support proposed changes in the Halibut Catch Sharing Plan that were important to the recreational fishery. The Forks mayor noted that "would greatly benefit the Washington North coast communities." (November 2003)
- A CPFV business owner in Sammamish noted that a sport groundfish closure in late 2004 would "require that I cancel all my trips and let my customers also cancel all hotel and dinner plans for October and November of 2004…"

Southern Washington

Three comments from three different people were received from Ilwaco and elsewhere in southern Washington. In sum, they said that Ilwaco had been negatively affected by recreational groundfish closures, that there was a perception that the system favored other states over Washington, and that regional management was needed; and commenters described the importance of recreational fisheries to small coastal communities (April 2004).

1.4.3.2 Oregon Comments

Comments were recorded from approximately 75 individuals from Oregon (some of these were provided to the Council in the form of a Sea Grant study that did not differentiate between individual commenters). Forty-four comments did not specify a location in Oregon. Of these, recreational commenters expressed concerns about the economic impacts of fewer recreational fishers coming to the Oregon coast. They named hotels, restaurants, tackle shops, boat repair shops, charter companies, guides, gas stations, and shopping malls as potentially suffering from cuts in recreational fishing, and noted that many communities were already suffering economic distress. They called for more data on the economic impacts of recreational fisheries, and several expressed the belief that recreational fisheries created more economic benefits and fewer environmental impacts than commercial fisheries.

Commercial fishermen and people commenting on commercial fishing expressed distrust of the management process ("Many no longer go to meetings because they feel it makes no difference, they won't be listened to anyway and decisions have been made ahead of time"), and some believed that management was determined to do away with commercial fishing. They expressed concern about neglect, reduced maintenance, and lack of insurance for fishing vessels ("Many fishermen are going on a 3-year haul out schedule instead of a 1-year schedule"); and lack of support services such as ice plants, fuel docks, gar suppliers and processors. In addition, they noted that cutbacks in other fisheries, like salmon, led to more community dependence on groundfish. They expressed frustration over the difficulty in planning for business purposes and the loss of family-wage jobs. A fisherman's wife reported on an increase in divorce in her social circle ("The financial stress was too much - that and husbands always being angry, moody, and withdrawn. After four years of that, they couldn't take it anymore.") Processors reported layoffs and reductions in the type of species purchased from fishermen ("I quit buying groundfish because I couldn't get the mix I needed for my market").

Non-fishing businesses also reported losses. (These reports were part of the Oregon Sea Grant study presented to the Council in September 2002). An auto dealer said he hadn't sold a car to a fisherman in two years; a radio station owner said advertising was down due to a loss of family wage jobs in his community; a jewelry store owner was said to have laid off four workers; a trucking company reported on cutbacks in hours; a grocery store was said to be keeping fewer accounts for fishing vessels; and gear store managers reported on lost revenue due to fishing regulations and feared that thousands of dollars worth netting they had ordered months in advance would be obsolete by the time it arrived.

Community members in Oregon who were not affiliated with the fishing industry also expressed concerns about crumbling infrastructure, loss of family wage jobs, and impacts on families from economic stress and uncertainty.

Northern Oregon Coast

There was one comment each from the commercial sector in Warrenton and Astoria. One comment described the economic impacts of a potential closure on Warrenton. The speaker noted that there were 30 trawl vessels fishing out of Warrenton, with an average gross exvessel value per vessel of $60,000. He noted that these 30 vessels produced an impact of $1.8 million in exvessel value for Warrenton alone (September 2003). A commenter from Astoria noted that local vessels were not benefiting from the northern Oregon sardine fishery, but that most of the benefits were going out of state (September 2002).

Central Oregon Coast

Comments were received from 18 individuals from the communities of Garibaldi, Pacific City, Depoe Bay, Newport, Toledo, Seal Rock, and Florence.

- A commenter from Depoe Bay voiced concern over the economic and social impacts of a potential sport fishery closure. She noted, "The closure would not only impact the owners of the boats, as they lose their business, but it would also affect from one degree to another all businesses that are touched by charter fishing. Any business that benefits from the tourism generated by the fishing fleet to the marine supply, to fuel docks, restaurants and motels, just to name a few..." She also expressed concern over the fate of the Memorial Day Fleet of Flowers, a 57-year-old tradition in which the charter boat and commercial fleet pay respects to fishermen lost at sea, and other impacts of a weakened charter fleet: "It will mean that no longer will the handicapped, the blind, the deaf, the mentally challenged be able to go ocean fishing. It will mean that many of elderly will not be able to continue with the pleasure of ocean fishing, because there will be no one to take them..." (June 2002)

- The Port of Siuslaw (Florence) wrote with concerns about possible recreational closures outside of 50 fathoms. They noted that "Recreational angling provides a great economic stimulus for Florence and the surrounding area" and expressed concern over the ripple effect of a fishery closure. (September 2003)
- The Garibaldi fishing community was concerned about a recent Labor Day groundfish closure. A processor wrote "that had a tremendous economic impact … [and] a very large psychological impact on my community. It was kind of like a kick in the face...all these people from all over the country who had plans to come to the Oregon coast to go fishing, to spend their money, those plans were stopped with 72 hour notice [or less]." A Garibaldi port commissioner wrote that the pre-Labor Day closure had cost Garibaldi $529,000. Both commercial and recreational fishers in Garibaldi stressed the economic impacts of management decisions on their community: "You have hurt us financially, putting our [three] boats… into dry dock because of the low quotas... You've made us ready to quit and sell our boats than to keep our profession of [fishing]." (November 2005)
- Commenters in Newport pointed out that the coastal economy had been depressed for quite some time. A joint letter from Senators Gordon Smith and Ron Wyden to the Secretary of Commerce noted, "the fishing communities of Oregon are in their worst financial condition in recent history and are depending upon you to carefully craft a balanced management plan…" (September 2002), and a commercial fishing family member wrote "be aware that the West Coast fishery as a whole is experiencing an overall depression. Depressed prices for salmon, shrimp, crab and tuna are adding to the general poor outlook for fisheries" (November 2002). A petition with 43 co-signers notified the Council that "the reduction in fish harvest levels [has] had a drastic impact to our community and that further reduction in groundfish harvest levels will continue to adversely affect every business and family in Newport. The reduction in harvest levels means direct jobs are lost, not only in the commercial fishing industry but also in the recreation fishing industry, processing plants, boat repair businesses and gear shops… The repercussions trickle down to the lodging, restaurant, attraction, entertainment, and retail industries. And when these tourism-based businesses lay off employees due to reduced revenues, this has an effect on other local businesses... It would be difficult to measure the number of jobs and revenues lost to the whole business community." A net shop owner noted "[We] plead the case here for expanding some fishing grounds or quotas to the draggers deploying this year.... A year from now, if these quotas and closed zones stay in effect, we will be having to turn fishermen away for fears of not being paid. Inventories at shoreside services are dwindling and the entire market infrastructure seems ready to collapse..." (June 2003). Another commenter wrote, "All over Oregon, our skippers and deckhands depend on the ground fishery to make a living and feed their families. Winter months through early Spring especially, all they were allowed to catch was bottom fish, to carry them through until salmon season starts again. This is the cycle you have put us in. Now you have ruled to take this away from us leaving nothing to make a living with this winter" (September 2004). The Embarcadero Resort Hotel & Marina estimated 1650 occupied rooms would be lost to the Resort with severe cuts or complete stoppage of groundfish fishing, and estimated total economic loss at $421,887 per

year (September 2002). A processor expressed alarm over whiting being listed as overfished, saying "80-90 people will be laid off [as result of whiting being listed as overfished]."

- In Toledo, a recreational fisher wrote "When [ODFW] shut down bottom fishing it devastated the Oregon coast economy. Not only was the sport industry affected; restaurants, hotels, gas stations, public sector, police, firemen (because of the tax base) - we lost a lot of money on the Oregon coast because of this. It is heartwrenching, because there [were] people on the Oregon coast who... lost their families, who lost their businesses. There were businesses reported losing $1400 per week... that had a devastating affect on our tax bases..."
- A commercial fisher from Pacific City, which hosts a dory fleet, expressed concern that VMS would force small vessels with limited income out of the fishery.
- A Seal Rock resident spoke in favor of potential closures, saying "I realize the importance of fishing to this community. However, I am also aware that no single species can be lost without contributing to the loss of another, eventually impacting the very quality of human life that we are all eager to maintain."

Southern Oregon Coast

Comments were received from 10 different people in Winchester Bay, Bandon, Coos Bay, Charleston, Port Orford, and Brookings-Harbor. (One comment was gathered as part of a Sea Grant study presented during public comment in September 2002).

- In Winchester Bay, a recreational fisher recalled the impacts of an earlier salmon closure on this primarily recreational port: "Many fishing related businesses closed and this area lost all our charter fishing businesses. We currently have only four charter offices providing offshore angling opportunities for our visitors." He noted, "Recreational angling provides a great economic stimulus for Winchester Bay and the surrounding area. If recreational angling were stopped, we would experience the ripple effect from another loss of fishing species." (September 2003)
- The Port Orford Port Manager commented, "Port Orford fishermen, the Port and the community of Port Orford have long derived economic benefit from groundfish landings from around our area. All are now suffering hardship because of declining stocks and harvest regulations." (March 2005)
- The Coos Bay Trawlers' Association expressed concern about the cumulative effect of management measures, including the trawl buy-back program, prohibitions on large roller gear, other gear restrictions, observer requirements, VMS, the Rockfish Conservation Area, and ITQs, which "reduced time on the water by 75 to 80 percent; reduced our earnings by at least 75%" (June 2005). The cost of VMS was problematic: "The state that has the highest unemployment rate, the state with the highest poverty level…has to pay for the system themselves..." (March 2004). In addition, trawlers were frustrated by frequent changes in management direction: "Changing the process again, midstream…is taking all these small [trawl] businesses by surprise, and will hurt many coastal communities… How can any business effectively operate in this kind of environment?..." (September 2003).
- In Charleston, a processor pointed out the difficulty in planning a business when faced with unexpected cuts: "Without proper notice the RCA zone was moved out to 250 fm, which causes a devastating ripple effect within our company. Over the past several months our company has invested approximately $80,000 to develop our new fillet room with the anticipation of Petrale season opening in October of this year. We are a small company just starting out in this business and this has made an enormous impact on our financial situation... Last year during the months of October, November and December we purchased several thousands pounds of Petrale, which made it possible for us to continue doing business by compensating enough income to keep

paying wages of our employees." (November 2004) Another processor emphasized the seasonal importance of the Petrale fishery: "The fall Petrale sole fishery has been a valuable economic asset to both the fishermen and processors at a time when both the weather and the late year limits put an economic hardship on the industry. By the current position of the 250 fm line the Petrale fishery has been eliminated. The Petrale fishery has become an established holiday season marketing item for the processors, brokers, wholesalers, restaurants, and grocery stores." (November 2004)

- Commenters from Brookings-Harbor were concerned about impacts to the recreational fishery. Responding to a sport groundfish closure, one commenter wrote, "The impact is being felt already by this community and is expected to multiply extensively in the next few days. Southern Oregon is struggling to create employment opportunities and keep this one key element of the tourism industry alive, which is our recreational fishing industry. This is a blow to our economy that is unexpected and, plainly speaking, should be justified to the general public…" (September 2004). Another commented that the on-again, off-again regulatory pattern "tears families apart, making it impossible to hire, train, and keep good employees, not to mention maintaining boats, trucks, fishing gear, and montages [sic]. It also tears at the social fabric of coastal communities, ports, fuel docks, suppliers, banks, and restaurants and other support industries, and the employees and families of those businesses" (November 2005). An RV park manager noted that when there are closures in California, it should be made clear to the public that they do not necessarily affect recreational fisheries out of Brookings (September 2002).

1.4.3.3 California Comments

Comments were received from 56 individuals in California. Of these, 15 did not specify a city or town in California. Nine were form letters from an angling organization which promoted angling's economic importance and lack of environmental impact. Two other comments from recreational anglers echoed the same concerns.

Four comments from commercial fishers expressed concern about the economic impacts of restrictions on sanddabs, California halibut, and the possibility of being restricted to fishing outside 200 fathoms. Another fisherman noted that "Over the last several years most of the hook and line fishermen have gone out of business because restrictive regulations have made fishing in this manner economically unrealistic."

<u>Northern California</u>

Comments were received from 15 individuals in northern California (defined as San Francisco and points north). Comments came from people located in Crescent City, McKinleyville, Samoa, Newport and Fort Bragg.

- In Crescent City, commercial fishermen expressed concern about protecting markets for "beach fish" (sanddabs, sole, and flounder) and other nearshore markets. A fisherman noted, "We badly need to have an increase in the black and blue rockfish component of our catch allowances. Without the seasonal increases in these fish, some of the last nearshore markets will be lost along with the infrastructure that supports them. Many fishermen, especially those who fish outside of the areas that can supply the live market, cannot make enough money to support their fishing efforts…" (June 2003) Another commercial fisherman was concerned about the effect of VMS requirements on blackcod fishermen (March 2005). The Crescent City Harbor District expressed concern over recreational seasons, saying "the reduction in our groundfish season will have a devastating impact on our port and local community...." Other recreational fishers noted that the recreational fishing season had been cut in 2004 to seven months, leading to economic losses; and the season was cut in 2005 to four months: "with the offshore weather we have here at Crescent City in the summer, the season will be less than [four months]...This is pure and simple economic damage caused by the federal government to our small community…" (April 2005). The mayor of Crescent City wrote with similar concerns, saying "The recent development of the recreational groundfish regulations is of much concern to the City of Crescent City and its residents. As you know, we have a deep and strong interest in both the commercial and sport fishing activities in our area. Any reduction in this season would have a detrimental effect on our economy and way of life" (April 2005).

- In Samoa, a groundfish trawl gear supplier said that his business had been cut in half during the past five years, that processing and supply infrastructure had contracted, and that fishermen were putting off maintenance on their vessels: "A blanket closure would mean the loss to the nation of these fisheries and the loss of the participants' livelihoods...." (June 2002). A recreational fisher in nearby McKinleyville wrote that a black rockfish closure would hurt California both economically and socially (June 2004).
- In Newport, a commenter said that a thornyheads/sablefish closure had "killed" the Newport dory fleet (September 2002).
- In Fort Bragg, a series of alarming newspaper articles in June 2002 led to a letter from the mayor saying, "This raises concerns in the City of Fort Bragg, because fishing is an important part of the economy. In addition, there are many residents who depend on local fish as a source of food." A charter business commented that "our community has been hit with several extreme newspaper articles… claiming that all fishing, sport and commercial, will be prohibited as of Jan 03 from Mexico to Canada. Our entire community is up in arms." In November 2005, salmon trollers in Fort Bragg expressed concern about increased fuel costs, asking for higher weekly and daily limits for sablefish.
- In June 2003, a recreational fisher passed along an editorial saying "We are already seeing several party boat operations being sold or forced out of business…many boats and supporting businesses (tackle shops, fuel docks, hotels etc.) depend on rockfish for winter their income. It's not a large part of their annual total but enough to pay their employees, insurance and berthing fees until the more lucrative salmon season opens. We are literally one bad salmon season away from losing most of the party boat operations along the Central coast. In a good salmon season these small businesses can scratch out a living but if the salmon don't show the cost of running a boat and paying its crew becomes impossible. Most at risk are boats and businesses in the smaller ports. Two of the largest party boat operations in Bodega Bay are currently selling out or closing down and more are sure to follow from Ft. Bragg to Bodget Bay…"
- In April 2006, a recreational fishing representative said that "If we reach the ABC/OY and have an early closure of any sort at all, we'll have economic effects that will be staggering to the CPFV fleet. Many, many businesses will close; families will be torn apart."
- A commercial representative encouraged the use of baseline data to measure socioeconomic impacts of fishery management actions (April 2006).

Central California – Moss Landing Area

Three comments were received from individuals in the Moss Landing area. Two were in response to potential cutbacks to protect bocaccio. One fisherman said there were no bocaccio where he fished for sablefish, and commented, "Have pity on us. There are no other job opportunities" (June 2002). A commercial fish buyer said his business had lost $1.5 million in potential business during the last three years, and that 40 restaurants had gone out of business due to management restrictions (June 2002). The Harbormaster wrote "There is a synergy that occurs which is unmeasurable in terms of cash value that needs to be considered in the development of fishing regulations, including the designation of essential fish habitats on the west coast. The public comes to the ports and harbors and enjoys getting their fresh seafood while watching the boats offload their catch. Without that, these small craft harbors become stagnant and turn into yacht harbors for the rich. The little guys are forced out and the working harbors cease to exist. We have seen this in southern California harbors and hope that that does not happen here. …" (June 2005).

Southern California – Morro Bay Area

Comments were received from five individuals in the Morro Bay area.

- In response to concerns raised by the Essential Fish Habitat Environmental Impact Statement (June 2005), the Mayor wrote that "Many of the alternatives in the [EFH] DEIS would appear to close fishing grounds to the extent that would eliminate landings in Morro Bay and finally put an end to our commercial fishing harbor…" and that "our harbor and its commercial fishing businesses depend on groundfish landings to support the harbor infrastructure, since many of our fishermen are mainly albacore, crab or salmon permittees with actual landings in the ports north of Morro Bay. Our City has suffered from the reductions in groundfish quotas, seasonal restrictions and area closures to the extent that the local groundfish market has almost collapsed and just a few of the traditional shore side support businesses are still hanging on." She noted that "In the last two years we have seen some hope as groundfish prices have gone up a little, quotas increased slightly, (but typically not what was promised) due to the federal buy-back program and Class A permittees have started to see a reasonable economic return for fishing again. We are hopeful that some uncertainty can be relieved for these local businesses and for the City." Others from Morro Bay also wrote with concerns about potential regulations resulting from the EFH EIS.
- In Port San Luis, the Harbor Master wrote (also in response to the EFH EIS) that "there are many small ports and harbors that have a symbiotic relationship with the fisheries industries, both sport and commercial, within the [EFH] EIS study region. These small craft harbors rely on the fisheries to provide steady jobs and act as an economic engine, keeping the community vibrant. In the case of central California harbors, the past few years of increased regulatory actions have had a drastic effect on the ability of the fishing fleets to continue making a profit. This decline, in turn, has had a direct effect on coastal host community (harbors and marinas). The implementation of regulatory closures or restrictions will have a deleterious economic effect on these local coastal communities..." (June 2005)

Southern California – Los Angeles/Santa Barbara Area

Comments were received from 16 different sources in this region, including a study conducted by the United Anglers of Southern California that was presented during public comment in June 2003 and recorded comments by recreational fishing business owners. Comments came from Balboa, Channel Islands Harbor, Long Beach, Oxnard, Port Hueneme, Port Wainimi, Santa Barbara Channel, Santa Barbara County, Ventura County, and other points in Southern California.

Recreational fishers made the following comments:

- A sportfishing business in Balboa, California noted that several state and federal closures had "contributed to what can only be described as a catastrophic situation for the sportfishing industry in southern California. A lack of catchable species is now being recognized by our attending and prospective customers and their interest and participation is at an all-time low for this time of year." He noted that groundfish are a staple for recreational fishing businesses during the winter months when migratory species are absent, and went on to say "Those who will be affected directly include boat and landing owners, captains, crewmembers, bait haulers, landing office personnel, etc. The businesses indirectly impacted would be tackle providers, fuel docks, boat maintenance and repair facilities (shipyards), manufacturers of fishing electronic equipment, vessel food and beverage vendors, and the list goes on" (June 2003).

- Another sportfishing business owner (in the UASC study) said she had reduced payroll by half and cut back hours to stay in business. She said "The regulations in place take away any chance of making any money…I don't know what else to do." Other business owners in the UASC study reported on lost clients, declines in charter bookings, lower revenues, layoffs, difficulty in paying harbor fees, and other challenges to their businesses (June 2003).
- A saltwater lure manufacturer (in the UASC study) said that December 2002 was the worst December in 42 years of business, and that dealers were reluctant to spend money on fishing lures (June 2003).
- Recreational fishermen were very concerned over limits on rockfish. A charterboat owner in Channel Islands Harbor wrote, "We have been regulated and pushed into shorter bag limits, depth restrictions, tackle cut backs, and an extremely short rockfish season in 2005. The toll of these regs have pushed many of us to borderline bankruptcy. Many of us depend upon groundfish to survive. We have been crippled by the extremely conservative approach... many of our livelihoods may lie in the balance of the Council's decision..." (April 2005)
- Concerns were noted all along the southern California coast. One commenter said, "Ten fathom restrictions would cause a major economic impact [to sport fishers in California south of Pt. Conception]" (June 2002). Another recreational fisher noted at a Council meeting, "[There has been] economic harm to the southern California sport fishery. It's a disaster. The further north you go, the greater the dependence on rockfish" (June 2003).

Commercial fishermen expressed concerns about fisheries infrastructure and cumulative effects:

- A letter from the Southern California Trawlers Association noted, "A significant concern relates to the cumulative impacts of these closures on the essential infrastructure required to sustain viable commercial "working" fishing ports and harbors along the 1,100 mile coastline of California. ... How much fishing area, how many fishing boats, are necessary to maintain the year-round sustainable infrastructure of buying stations, ice houses, hoists, fish processing plants, wholesalers and retailers, that can provide fresh California seafood to seafood consumers?" (June 2005)
- A fixed gear fisherman commented, "In Southern California, with the Cowcod Conservation Area, Rockfish Conservation Area, deeper nearshore permit, nearshore permit, marine sanctuary, whatever, we're running out of stuff to do. And we can't afford to lose this fishery... if we implement this [observer] data, it's going to kill us" (September 2003).
- Others were concerned about small artisanal fisheries in Santa Barbara Channel: "There are small, local, artisanal fisheries that have been fishing sustainably with little bycatch in the Santa Barbara Channel for decades that are going to be eliminated with most of the alternative regulation packages you are considering for resolving the canary, yelloweye, and bocaccio rockfish problems" (June 2002).
- One fisherman commented on the difficulty in planning for business: "How do fish businesses…[recreational boats], processors, buyers, restaurants, fish markets, how do they function and pay taxes and keep the port working if they're not allowed to catch their allocated OY? How do they do their financial planning? Some folks are considering marketing campaigns [to sell] the fish that are caught - to get the highest value added, and certain marketing campaigns go out - and then all of a sudden the season's closed, and people have spent a great deal in marketing their fish... or in the case of the recreational fishermen, putting out ads for their season..." (March 2004)

Southern California – San Diego Area

There were comments from three individuals in the San Diego area.

- A manufacturer of plastic baits (in the UASC study) noted that business was down 20% in 2002 compared to 2001. He said he had considered moving his business out of state or to Mexico to lower costs, and had cut back on his employee's hours. He also noted that historically his business had participated in "every underprivileged kids' fishing trip out there. Is stopping all of this - he can no longer afford it." (June 2003)
- A commercial live fish fisherman wrote, "I and others had been able to maintain a sustainable [live fish] fishery as well as keep a successful business - with employees! That was when we were allowed to fish all year (with quotas) and target more than one species. Now, we have been regulated to fish only four months of the year! … Regulations are putting me out of business..." (June 2003)

1.4.3.4 Comments from coastwide organizations

A large number of comments originated with coastwide or national organizations. Many of these were part of email or postcard campaigns. Although they were primarily focused on environmental protection, they are included here because they also make reference to socioeconomic impacts (additional comments from environmental organizations are described in section X).

- Managers received 19,343 comments originating from Oceana and 8,266 originating from Environment California with the following wording, or a variation thereof: "A healthy Pacific Ocean is crucial for our way of life including our economy and recreation. For more than three years, Oceana has been bringing science and information to the PFMC and NOAA regarding the importance of protecting deep sea corals and sponges from bottom trawling. I support protecting ecologically sensitive areas of the Pacific seafloor such as corals and sponges, and special places such as seamounts, biogenic areas, and deep sea canyons from destructive commercial fishing. As you consider the [EFH EIS], please adopt Alternative 12, which protects habitat and maintains vibrant fisheries" (June 2005).
- Managers received 382 comments saying "...Pacific groundfish are in trouble. Years of heavy fishing have taken their toll so that today both the fish and the fishermen are suffering. We must take steps today to restore our oceans so that our marine wildlife and our fisheries can thrive in the future. Protecting EFH is one of the most important steps on this path" (June 2005).

In addition, there were four comments from other organizations:

- The Fishing Heritage Group, made up of representatives of Environmental Defense, the City of Morro Bay, and the City of Monterey, presented a list of their goals and a consensus map of no-trawl zones to the Council. They wrote that "Starting in the early 1990s, fishing opportunities for west coast groundfish…have become increasingly constrained as a result of reductions in total allowable catch. Efforts to keep the fishing open year-round resulted in reductions in smaller and smaller trip limits, making it difficult for fishermen to make a living, and for ports to maintain revenues. The establishment of very large areas closed to rockfishing resulted in further economic distress. As a result, the working harbors of the central California coast have become fragile - their health linked to declining fish landings and revenues…" (June 2005)
- The Pacific Marine Conservation Council (PMCC) wrote, "PMCC has consistently testified to the Council that we believe that it is important to assess whether disparate adverse economic

impacts may accrue to individual communities if important opportunities are lost due to restricted access. NOAA Fisheries can determine this to some degree using economic and spatial effort data regarding the trawl fishery, but it remains essential to engage fishermen in this process… PMCC believes that NOAA Fisheries' outreach in coastal communities with regard to the [EFH] DEIS should have been more extensive. Additional constructive input from people who make their living on or near the water would have resulted in a more comprehensive EFH EIS, and in superior protection of sensitive marine habitats with minimal impact on fishing communities" (June 2005)

- A representative from the Natural Resources Defense Council said, "The 9th Circuit case reaffirms the Magnuson Act requirements to rebuild depleted species as quickly as possible… That language doesn't mean that the Council and NMFS should balance biological and economic needs; on the contrary, the decision reaffirms earlier ones in holding that… "the purpose of the act is clearly to give conservation of fish priority over short-term economic issues." …Without immediate efforts to rebuild, the long term survival of fishing communities is in doubt. The court also affirmed that Congress wanted to leave leeway to allow fishing on healthy stocks and avoid disastrous short term effects…" (April 2006)
- A representative of Pacific Seafood Group, which operates throughout the West Coast states, said "If the OYs are overly restrictive, the negative economic consequences could occur in the tens of millions of dollars. Many coastal communities are struggling now. An economic impact of this magnitude would create a depression in some areas. Lastly, the Council management teams and industry have crafted innovative and creative management tools in the last few years. Let us use those tools now to find solutions that avoid economic tragedy."

1.4.3.5 Comments from unidentified locations

Forty-five comments (some of which were multiple comments by the same person) did not specify a geographic origin. Many repeated the themes in the comments listed above. Seventeen comments dealt with general socioeconomic impacts to communities, calling for managers to consider effects on communities, to develop better information on community impacts, to consider the economic impacts of recreational fisheries, and to consider cumulative impacts of regulations on communities. Fourteen comments dealt with the effects of regulations on businesses, saying that if certain closures were to take place, there would layoffs, closures, or other hardships. Four comments dealt with processors, marketing, and infrastructure. Three comments called for long-term environmental protection, including ecosystem management, despite short-term economic consequences.

One comment each said businesses need better information for planning; that more EFPs should be implemented; that marine sanctuaries would harm the fishing industry; that sportfishing caused less ecological damage and more economic benefit than commercial fishing; and that closing the recreational fishery during the warmer months would not cause as much hardship as closing it during the winter months, when there are fewer fishing options. One comment questioned the use of 2000-2002 as a baseline for socioeconomic impacts; one called for real-time observer data; and one said that nearshore closures can pose safety risks to small trawlers.

1.4.3.6 Comments from nongovernmental organizations

Most of the comments described above focused exclusively on socioeconomic impacts. Some referred to the balance between short-term economic impacts and long-term environmental protection. The comments below came directly from nongovernmental organizations (the letters are included in their entirety in Appendix B).

Natural Resources Defense Council, the Ocean Conservancy, and Oceana together wrote (March 30,

2006) commenting on the 2007-2008 specifications proposed for yelloweye rockfish. The authors take issue with the GMT's proposal to increase the OY above that identified by the SSC. The letter calls for the Council to rebuild yelloweye as quickly as possible, and to follow the SSC's advice regarding rebuilding periods for yelloweye. The letter expresses concern that the GMT proposal would create a risk of serial depletion of yelloweye, and notes that uncertainty levels are very high for this species. The authors call for the Council and NMFS to develop a systematic approach for identifying the shortest time possible for rebuilding overfished species, before the next round of revisions to rebuilding plans, and to pursue steps to reduce yelloweye effort and catch, similar to those taken to reduce cowcod effort quickly in 2003. They also call for regional management of this species, since depletion levels vary significantly by state, and calls for increased observer coverage on the commercial halibut fleet and funding for fishery-independent surveys.

The letter suggests taking quick action to identify and close yelloweye hotspots to reduce bycatch, and mining observer data to develop spatial management tools, noting "the more quickly such action is taken to rebuild populations like yelloweye, the faster fishing communities will reap the benefits of healthier stocks." The authors note that "a recent study of the economic implications of rebuilding depleted rockfish populations found that the catch of overfished Pacific groundfish is worth three times as much (net present value) once they are rebuilt as in their current depleted state…These findings underscore the economic benefits of staying the course of rebuilding and of tools like protected areas that can help avoid overfishing in the first place."

In addition, Oceana wrote (April 5, 2006):

- "We request that [NOAA Fisheries] immediately review, analyze, and present a comprehensive report of salmon bycatch in the Pacific groundfish fisheries, in particular the whiting fishery and bottom trawl fisheries, to the [PFMC] and the public… We recommend this information include the estimated interception of Klamath River Chinook salmon."
- "We recommend...[including] a description of the methodology of salmon bycatch accounting presently used, and a discussion of any deficiencies… [by the April or June 2006 meeting]."

1.4.3.7 Other scoping comments

In addition to the comments listed above, we received a scoping letter from the Environmental Protection Agency that is included in Appendix B.

1.4.4 Criteria Used to Evaluate the Impacts of the Proposed Action

Council and NMFS staff began their work by assessing the proposed actions in order to identify environmental impacts and narrow the scope of the present analysis to the significant issues that will be analyzed in depth and eliminating from detailed study the issues which are not significant (40 CFR 1501.7). They used 16 factors listed in enumerated in National Oceanic and Atmospheric Administration (NOAA) National Environmental Policy Act (NEPA) guidance (NAO 216-6) §6.01, which reproduces the factors defining "significant" listed at 40 CFR 1508.27, and §6.02, specific guidance on fishery management actions, in order to screen for potentially significant impacts and determine the scope of the analysis. The §6.02 criteria are listed first below and generally focus on components of the human environment potentially affected by a fishery management action. The §6.01 criteria are related to the intensity—or severity—of the impact, which were considered in the context of the environmental components listed in §6.02. As part of this process NMFS and Council staff reviewed the 2005-2006 groundfish harvest specifications and management measures EIS. This review assessed whether the impacts of the current proposed action would differ substantially from those of the interim allocation, increasing the likelihood of significant impacts.

1-2) Can the proposed action be reasonably expected to jeopardize the sustainability of any target or non-target species that may be affected by the action?

The proposed actions have both short- and long-term effects resulting from establishing ABC and OY values for the 2007–08 biennium and, for depleted species, related long-term rebuilding targets. Short-term impacts resulting from harvests during the biennial period will not be significant if total fishing mortality is constrained at or below OYs or other biologically based harvest limits and these limits will allow stocks to remain at or above, or rebuild to, the B_{MSY} proxy, based on stock assessment and rebuilding analyses, which are the best available scientific information. However, there are several sources of uncertainty, which increase the risk that significant impacts could occur. This uncertainty includes measurement error and future natural environmental variation affecting stock productivity. Underestimating actual total fishing mortality, based on landings and observer data, is an example of measurement error that increases the risk of significant impacts. Future adverse environmental conditions affecting recruitment is an example of environmental variation that could delay rebuilding a depleted stock beyond the designated target year. (For a lengthier discussion of sources of risk refer to Appendix A to the 2005–06 groundfish harvest specifications EIS, pages A-28–A-30.) Thus, although a primary objective of the management regime is to constrain fishing mortality to non-significant levels, these sources of risk require a detailed evaluation of sources and levels of fishing mortality and the risks associated with both short-term OYs and long-term rebuilding targets. Chapter 4 evaluates fishing-related impacts to target and nontarget groundfish and other incidentally caught fish species.

3) Can the proposed action be reasonably expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH) as defined under the Magnuson-Stevens Act and identified in FMPs?

Disturbance of benthic habitat by fishing gear is the principal impact of the proposed actions. In particular, there is concern about the effect of bottom trawl gear in high relief areas hosting complex biogenic benthic habitat such as cold water corals and large sponges. Given that the amount of fishing effort occurring in 2007–08 is unlikely to increase beyond levels seen in the recent benthic disturbance will not likely increase. Furthermore, NMFS and the Council recently completed a multi-year project to reevaluate the groundfish EFH identification and implement new mitigation measures for fishing-related impacts. These mitigation measures, which include closing areas thought to encompass sensitive habitat to bottom trawling, will likely result in reduced fishing-related impacts to EFH. Chapter 3 describes these mitigation measures and evaluates the impact of the proposed action.

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

Health and safety related concerns focus on management measures that make it more likely vessels will fish in bad weather or hazardous ocean conditions. For example, Rockfish Conservation Areas—depth-based closed areas established to reduce depleted species bycatch—could require vessels to fish farther offshore in order to access target stocks. Pages A-35–A-38 in Appendix A to the 2005–06 groundfish harvest specifications EIS contains a general discussion of vessel safety. Management measures included under the proposed action are not anticipated to substantially affect vessel safety in a way different from the 2005–06 biennium and these effects are not evaluated further in this EIS.

5) Can the proposed action be reasonably expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

Groundfish fisheries do incidentally catch species listed under the ESA and marine mammals, but at levels that have been determined not to jeopardize the continued existence ESA-listed species or contribute substantially to mortality of marine mammals not listed under the ESA. Listed stocks of salmon taken in the groundfish trawl fisheries are of principal concern. Pursuant to the ESA NMFS initiated section 7 consultations eight times on the groundfish FMP to address bycatch of listed salmon stocks. The most recent consultation was concluded with the signing of a supplemental biological opinion on March 11, 2006, {NMFS, 2006 1075 /id} because expected bycatch in previous incidental take statements had been exceeded three times from 2002 through 2005. Chapter 5 in this EIS evaluates impacts to ESA-listed salmon stocks based on information provided in the supplemental biological opinion.

6) Can the proposed action be expected to have a substantial impact on biodiversity and ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

The proposed action will primarily affect biodiversity and ecosystem function through the removal of target, non-target, and protected species. These are considered cumulative effects and evaluated as such.

7) Are significant social or economic impacts interrelated with significant natural or physical environmental effects?

Groundfish landings translate into exvessel revenue and generate income for fishery participants, fish processors, and others in fishing communities. Over the long term depletion of some groundfish species has been a significant natural environmental effect and measures to rebuild these stocks could have significant adverse socioeconomic effects resulting from setting low OYs for these species. Low OYs for depleted species can constrain catches of target species resulting in substantial declines in overall revenue. As discussed previously in this chapter, a recent court decision has emphasized the need to demonstrate the stock rebuilding will occur in the shortest time possible while taking into account the short-term needs of fishing communities. This suggests that significant adverse socioeconomic impacts should be avoided; but some unavoidable significant adverse impacts (for example, to certain fishing communities) could occur in order to rebuild depleted groundfish stocks. Chapter 7 evaluate impacts to fishery sectors and fishing communities.

8) To what degree are the effects on the quality of the human environment likely to be highly controversial?

Past decisions on stock rebuilding and setting harvest specifications has been subject to litigation. As noted, the reconsideration of current rebuilding plans is in response to a court decision. These factors indicate that the effects are considered controversial.

9) Can the proposed action be reasonably expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

Given the nature of the activities authorized under the proposed action, the principal effect to unique areas would be in the context of EFH. These effects are evaluated in Chapter 3.

10) To what degree are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

There is uncertainty about whether short-term harvest limits will result in stock rebuilding by the target year identified in the rebuilding plan. The nature of these risks was summarized in the discussion of factors 1 and 2.

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

This EIS considers cumulative effects to the environmental components evaluated in Chapters 3–7.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

The proposed action will not affect historic places or result in the loss or destruction of significant scientific, cultural, or historical resources. As noted above, the primary adverse impact of the proposed action is the removal of target and nontarget finfish species, potential adverse effects to EFH, and the incidental take of protected species. To the extent these may be construed as scientific or cultural resources, the proposed actions are not expected to result in a significant level of loss or destruction. The proposed actions could have indirect and cumulative adverse impacts to fishing communities, which might affect cultural resources such as the local social fabric, culture, and image of affected communities.

13) Can the proposed action be reasonably expected to result in the introduction or spread of a non-indigenous species?

The proposed actions do not involve the transport of non-indigenous species. Fishing vessels participating in the proposed action are located in local ports and will not increase the risk of introduction through ballast water or hull fouling.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

The adoption of new rebuilding targets sets a precedent for establishing future harvest specifications consistent with those targets. Rebuilding plans revised by Amendment 16-4 may be further revised by future FMP amendments in response to new information, changes in the law or regulations, or future court decisions. Future effects are likely to be similar to those described in this EIS and past EISs evaluating harvest specifications (in 2003, 2004, and for the 2005-2006 biennium). But the intensity of these effects are hard to predict, and could be significant.

15) Can the proposed action be reasonably expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Chapter 9 describes potentially applicable cross-cutting mandates; the proposed actions will be implemented in such a way as to address applicable requirements of these laws and executive orders.

16) Can the proposed action be reasonably expected to result in beneficial impacts, not otherwise identified and described above?

The proposed actions are intended to have a beneficial effect by establishing harvest limits consistent with MSY, including targets to rebuilding depleted stocks to a biomass capable of supporting MSY. This will have both beneficial natural environmental and socioeconomic effects.

Table 1-1. Scoping comments related to community impacts.

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
2002: April			
Pt. Adams Packing Co. will not operate; 80-90 people will be laid off [as result of whiting being listed as overfished]	April 2002	Hammond, OR	Commercial
[Talked about impacts to Crescent City]	April 2002	Crescent City, CA	Commercial
2002: June			
Losing rockfish would be catastrophic. [Sportfishing business]	June 2002	Long Beach, CA	Recreational
Closing rockfish would put us out of business. [Charter skipper]	June 2002	Oxnard, CA	Recreational
Closing the shelf will kill us. [Sportfishing business]	June 2002	Los Angeles, CA	Recreational
Neah Bay trawlers need to fish in July-August; can't fish later in our small boats. Can only fish on the shelf. Seven ninths of the Neah Bay fleet are small boats.	June 2002	Neah Bay, WA	Commercial
Ten fathom restrictions would cause a major economic impact [to sport fishers in California south of Pt. Conception].	June 2002	Southern California	Recreational
Licenses would be cut by 80% by having to fish in less than 10 fathoms. Might make a living fishing at less than 20 fm. [Sport fishing operator]	June 2002		Recreational
Consider economic impacts [Sport fishing operator]	June 2002	Oxnard, CA	Recreational
Concerned with restrictions in less than 10 fm. Lots of communities will be put out of business. [Charter operator]	June 2002	Port Wainimi, CA	Recreational
[There are no bocaccio where we fish for sablefish.] Have pity on us. There are no other job opportunities. [Commercial fisherman]	June 2002	Moss Landing, CA	Commercial
There has been $1.5 million in foregone benefits in the last three years in my business. Forty restaurants have gone out of business due to these restrictions. [Commercial fish buyer]	June 2002	Moss Landing, CA	Fishing-related business
The northern ports in southern California depend heavily on groundfish. People are scared. [There have been] $2.5 billion in recreational impacts in California.	June 2002	Northern California	Recreational
There has been recent publicity in regional papers that the Council may impose severe measures on commercial and sport fishing for 2003. This raises concerns in the City of Fort Bragg, because fishing is an important part of the economy. In addition, there are many residents who depend on local fish as a source of food.	June 2002	Fort Bragg, CA	Community

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
We are in the commercial fishing industry and in the paper we read that we could face worse cutbacks next year [than] we already have. … Someone needs to get their head out of the sand and really see what is happening. … We are all having to be put out of business because of someone's assumptions. Why not let the fishermen show what is out there? We all have to sit back and wait while you drive us into bankruptcy when we see the stocks are there. ... It's time to check [your data] or give us a way out without going totally broke!!!!!	June 2002		Commercial
…The Pacific Fishery Management Council is recommending eliminating all bottom fishing by January 2003. If this passes through the Council and is adopted, it will be a disaster for Oregon's coastal economy, as well as a huge disappointment for all sports fishermen. ... I think the economic impact of this decision must be balanced with any concern for the fish.... if there is anything you can do to help keep the sport fishing open, it will keep the charter boats, the guides and the private fishermen on the water. If bottom fishing is eliminated for sportsmen, all the ocean charters will cease to exist... sportsmen make a huge contribution to the local economy. Depending on the area, we are talking about millions and millions of dollars, from gas stations to shopping malls to hotels and restaurants, etc. ... Sportsmen generate 40 times as much money per pound of fish caught than commercially caught fish for the economy...	June 2002	Oregon	Recreational
We operate a charter boat business in Fort Bragg, California. Our community has been hit with several extreme newspaper articles… claiming that all fishing, sport and commercial, will be prohibited as of Jan 03 from Mexico to Canada. Our entire community is up in arms. For several years, we have asked for biologists to board our vessels and actually document what fish we are catching...	June 2002	Fort Bragg, CA	Recreational
I implore you NOT to implement closures. Closures are unwarranted. Closures are not needed to help the fish populations. Closures destroy industries. … Those of us who spend time on the water constantly are opposed to closures because we know they are not needed for the fish, and because we know the impact on our industry and related industries will be totally devastating. ...	June 2002	Santa Barbara, CA	Recreational

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
… I urge you to make a thorough study of the anecdotal experiences of long time recreational anglers and sportboat captains on a regional basis. In California, we are talking about a constituency of nearly 1 million anglers that pay to use and conserve the resource, not exploit and profit from it. You will find that our reality, times several hundred million dollars of economic impact, differs widely from those who craft research to gain grants, and those who fish for profit alone. [This wording appeared in 9 different emails from anglers]	June 2002	California	Recreational
Please try to see all sides of the story before making any decisions. The angling community is a large one that contributes to our economy as well as the well being of our oceans.	June 2002		Recreational
You are certain to hear the many economic reasons of how the closure of the sport fishing industry would impact our already failing economy. The closure would not only impact the owners of the boats, as they lose their business, but it would also affect from one degree to another all businesses that are touched by charter fishing. Any business that benefits from the tourism generated by the fishing fleet to the marine supply, to fuel docks, restaurants and motels, just to name a few. The loss in dollars to the oil companies who supply the fuel and oil for the fleets will not be insignificant, and will certainly spell doom for many of their business[es].	June 2002	Depoe Bay, OR	Recreational
I would like to address a more finite aspect of a possible loss of the charter fishing fleet. Memorial Day; for the past 57 years the small community of Depoe Bay, Oregon has paid tribute to those lost at sea… Without a charter fleet there will be no Memorial Day Fleet of Flowers. For those of us who have someone "at sea," who have no grave to go to, this one day has deep meaning for us...	June 2002	Depoe Bay, OR	Recreational
The loss of the charter fleet spells other things as well. It will mean that no longer will the handicapped, the blind, the deaf, the mentally challenged be able to go ocean fishing. It will mean that many of elderly will not be able to continue with the pleasure of ocean fishing, because there will be no one to take them...	June 2002	Depoe Bay, OR	Recreational
The charter fishing industry is unique; it is not something that can be shut down with the expectation that we can import it from another country. It will be the loss of an important part of a special way of life, of private enterprise; and, more to the point, the loss of a large part of the coastal economy.	June 2002	Depoe Bay, OR	Recreational
The economic impact of the elimination of the rockfish fishery off the California coast will be devastating, and will surely lead to bankruptcy for many and to major dislocation for others.	June 2002	California	Recreational

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
…The closure, if it comes, will have a devastating effect on the small businesses operating charter and open party sportfishing boats in [Congressman Gallegly's district], and appears to be in direct conflict with the overwhelming view of the fishermen that the stocks are, in fact, in better shape that just three years ago!	June 2002	California	Recreational
My business has been supplying trawl gear to the groundfish fleet on this coast since 1979. In the past five years, we have seen our business cut in half as a result of the starvation policy you have carried out in an attempt to manage the fisheries on this coast. I feel that a closure of the shelf would mean we could no longer remain in business. The Council's policy of ever-decreasing trip limits has reached its final conclusion; the resource has been wasted, the processing and supply infrastructure has contracted, the fishing vessels have become unsafe and in some cases, completely unseaworthy. These vessels are now faced with fishing for less fish and less money, while paying more for the necessary supplies with which to do so. ... A blanket closure would mean the loss to the nation of these fisheries and the loss of the participants' livelihoods.... Systematically destroying the economic viability of commercial fishing and thus precipitating a Final Full Closure is not a management method.	June 2002	Samoa, CA	Fishing-related business
Let me list the fisheries which my business supplies and which will be impacted by this closure: ... Petrale and English sole, sand dabs, pink shrimp, California halibut, and cucumber...hake and chilipepper...prawns.	June 2002	Samoa, CA	Fishing-related business
There are small, local, artisanal fisheries that have been fishing sustainably with little bycatch in the Santa Barbara Channel for decades that are going to be eliminated with most of the alternative regulation packages you are considering for resolving the canary, yelloweye, and bocaccio rockfish problems.	June 2002	Santa Barbara Channel, CA	Commercial
2002: September			
Businesses need to plan - need information. Don't hide [information]. Provide some information early on.	September 2002	[Coastwide organization]	General

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
The Embarcadero Resort Hotel & Marine (Newport, OR) estimates 1650 occupied rooms would be lost to the Resort with severe cuts or complete stoppage of ground fishing. This would further impact the restaurant with local fishing families no longer being able to have a night out, come for Sunday brunch, or have banquets. In addition, the transient tourist who does charter fishing would not be dining either, nor would some of the groups come who focus on fishing as their extracurricular activity. ... Total economic loss [is estimated at] $421,887 [per year]. Quite an impact to what you know will devastate the economy of Newport, Lincoln County, the Oregon Coast, Oregon, the Northwest, and the West Coast. It is obvious the disaster ahead and the many who will suffer.	September 2002	Newport, OR	Non-fishing business
We, the undersigned citizens and business people of the City of Newport and members of the Greater Newport Chamber of Commerce, notify the PFMC that the reduction in fish harvest levels have had a drastic impact to our community and that further reduction in groundfish harvest levels will continue to adversely effect every business and family in Newport. The reduction in harvest levels means direct jobs are lost, not only in the commercial fishing industry but also in the recreation fishing industry, processing plants, boat repair businesses and gear shops. However, the impact doesn't end there. The repercussions trickle down to the lodging, restaurant, attraction, entertainment, and retail industries. And when these tourism based businesses lay off employees due to reduced revenues, this has an effect on other local businesses... It would be difficult to measure the number of jobs and revenues lost to the whole business community. We urge the PFMC to seriously reconsider the social and economic impacts their decision will have to coastal communities depending on the fishing industry. [43 co-signers]	September 2002	Newport, OR	Community
…Oregon's commercial fishing industry helped build our state and continues to employ thousands of people involved in catching, processing and distributing high quality seafood across the country. But that industry, its workers and families, are being threatened by drastic reductions to the amount of fish that can be caught off the Oregon coast - reductions that may be made with little regard to the economic consequences. ... We remind you that the fishing communities of Oregon are in their worst financial condition in recent history and are depending upon you to carefully craft a balanced management plan. ... We urge you to direct NMFS to adopt reasonable 2003 groundfish catch guidelines made by the Council that consider sound science and the economic impact to coastal communities.	September 2002	Newport, OR	Commercial

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
Significant socioeconomic impacts are already occurring. Community fisheries infrastructure is eroding and all fisheries are being impacted by the reductions in groundfish. Trickle down effects should be considered and are already occurring. The Council should assess the impacts to secondary and tertiary businesses.	September 2002	Oregon	Community
Landings and value should not be the only data considered in any socioeconomic impact analysis. This will not give you an accurate picture of what is happening at the ground level in coastal communities as a result of management decisions. Landings and value data alone do not reflect the negative impacts to individuals and businesses.	September 2002	Oregon	Community
Many fishermen fervently feel that fisheries management agencies have an agenda to close down the fishery. Many no longer go to meetings because they feel it makes no difference, they won't be listened to anyway and decisions have been made ahead of time. ... Most fishermen and their families cannot afford the travel time and expense away from home.	September 2002	Oregon	Commercial
People need information so they can make adjustments to their business strategies now rather than after all their resources are used up trying to hang on.	September 2002	Oregon	General
I haven't sold a vehicle to a fisherman in 2 years. [Salesman, auto dealer]	September 2002	Oregon	Non-fishing business
We are losing family wage jobs on the coast and we can't afford to do that. Consider the trickle down effect that is now occurring. Advertising is down at my radio station due to the shrinking base of family wage jobs - fishing is critical to our communities. [Radio station owner]	September 2002	Oregon	Non-fishing business
How will the full range of economic impacts be considered? We've had a fire disaster in our region this summer and we're already hurting badly from that. [County commissioner]	September 2002	Oregon	Community
Coast communities don't have many opportunities for family wage jobs like we see in the valley. Fishing is critical to us here. [Mayor]	September 2002	Oregon	Community
The Council and NMFS should try harder to do a better job of releasing information to the media. People think that because there are recreational closures in California, that Brookings is closed also - not true… [RV park manager]	September 2002	Brookings, OR	Non-fishing business
We need to fight to save coastal family wage jobs. [Mayor]	September 2002	Oregon	Community

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
More vessels are now operating without insurance. That could easily ruin the family business. Ports and communities will have to respond and pay for things like cleanup. Plus, there are significant costs associated with Coast Guard search and rescue. When maintenance is put off, more accidents happen and taxpayers will have to cover the costs. [Port manager]	September 2002	Oregon	Commercial
The local jewelry store laid off four workers. They don't have the business they need anymore from fishermen and their families. [Port commissioner]	September 2002	Oregon	Non-fishing business
The industry isn't collapsing but we need help right now with readjustment initiatives. We are a community of survivors. Rural communities need to remain independent. Don't take that away. [Port manager]	September 2002	Oregon	Community
There are limited jobs you can retrain for in our community which will support a family. [Port manager]	September 2002	Oregon	Community
A buyback program will help some fishermen but won't help other businesses. [Radio station owner]	September 2002	Oregon	Non-fishing business
Shipyard business is way down. Many fishermen are going on a 3-year haul out schedule instead of a 1-year schedule. We are concerned about safety. [Insurance agent]	September 2002	Oregon	Non-fishing business
The local fuel dock is ready to shut down. [Fishing family member]	September 2002	Oregon	General
Consider the time and goods and services involved in getting ready for fishing seasons that don't happen. This is significant lost revenue for my store. [Gear store manager]	September 2002	Oregon	Fishing-related business
I couldn't get ice this summer so even though we had a good salmon fishery, we couldn't get the ice to hold the fish. My fish plant closed. [Salmon troller]	September 2002	Oregon	Commercial
My firm is cutting back and may go out of business. I can hardly afford to keep working because of the reduced demand for trucking. There's now only a few months of work. [Trucker for firm that transports product from fish plants]	September 2002	Oregon	Fishing-related business
Our fish plant closed and we couldn't get a market with another plant. So we've moved our fishing business out of state. [Fisherman's wife]	September 2002	Oregon	Commercial
I quit buying groundfish because I couldn’t get the mix I needed for my market. I laid off 15 workers. [Fish buyer]	September 2002	Oregon	Processing
The local grocery store used to carry lots of boat accounts - those are way down now and there are more and more accounts in arrears.	September 2002	Oregon	Non-fishing business
In fact, lots of associated businesses are being hit - marine electronics included. Business is down and what business they have, it's hard to get folks to keep their accounts current.	September 2002	Oregon	Fishing-related business

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
It isn't reasonable for NMFS to seek to enact regulations that will eradicate family businesses without a specific economic plan in place to assist those businesses and replace those jobs. And I'm not talking about 10 dollar an hour jobs - I'm talking about jobs for crewmen who earn between $35,000 and $40,000 per year. [Fisherman's wife]	September 2002	Oregon	Commercial
Families are so frustrated - we feel we never know what's next. No one can plan a successful fishing business with so many unknowns. Who will be in, who will be out. If you are out then what - nothing. Nothing is clear-cut. We won't even know next year's restrictions until just before the season actually starts - and that's if we are lucky. Our financial reserves are gone - what can we do? [Fisherman's wife]	September 2002	Oregon	Commercial
Two of my friends are now getting divorces. The financial stress was too much - that and husbands always being angry, moody, and withdrawn. After four years of that, they (the wives) couldn’t take it any more. [Fisherman's wife]	September 2002	Oregon	Commercial
I'm very concerned about the crumbling infrastructure - it's worse in some ports than others but all are experiencing it. Processors, fuel docks, gear suppliers - they are shutting down. Once that happens, I fear we won't be able to go back and rebuild. There may well be no infrastructure left to support the industry of the future. [Gear store owner]	September 2002	Oregon	Fishing-related business
I have $90,000 worth of netting on order - I had to place the order 6-8 months ago in order for it to be here for the 2003 season (needs one year lead time). The order has been shipped - it's on a ship in a container. I fear once it gets here it will be illegal and I won't be able to sell it. I can't send it back - it's happened to me before. I need to be able to plan my business better than the current management system allows. Seems like I could at least get a tax credit for merchandise I can no longer sell. I have to assume full liability. [Gear store owner]	September 2002	Oregon	Fishing-related business
Economic data mainly focuses on the commercial sector, not recreational. We need more recreational data. [Charter boat owner]	September 2002	Oregon	Recreational
Oregon's economy is a mess and the coastal economy is even worse. If you'd just let us work, we have a lot to contribute. [Fisherman]	September 2002	Oregon	Commercial
Other fisheries are already being negatively impacted by the groundfish crisis - more pressure in albacore tuna specialty markets for example - only so much room on the shelf and existing businesses are being pushed aside. [fisherman]	September 2002	Oregon	Commercial

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
Groundfish issues are of great concern to crabbers. There already have been impacts. There's now more pressure on the resource and there may be gear and habitat conflicts when we start implementing area closures. We're losing processing capacity. [Commodity commission manager]	September 2002	Oregon	Processing
What are the community impacts of fish businesses using less water and power? This translates to less income for the city/county. [Processor representative]	September 2002	Oregon	Community
Fishermen are treated as criminals by NMFS for even small overages. And this on top of everything else! Decriminalize the system and us! [Fisherman]	September 2002	Oregon	Commercial
The Magnuson Act should be the Sustainable Fishing Community Act. [Fisherman's wife]	September 2002	Oregon	Community
I'm very concerned about our crumbling infrastructure - once existing support facilities like fueling stations and fish processing plants are gone, environmental rules will make it hard for new ones to come in, even when fishing improves. [Sea Grant marine agent]	September 2002	Oregon	Community
The local women's shelter is full - families are breaking up - this thing has gone on so long and there are so many uncertainties that it's tearing some families apart. You can imagine how it gets at home when money is tight. [Groundfish Disaster Outreach Program staff]	September 2002	Oregon	Community
How will NMFS gather community impact data such as business impacts? [GDOP staff]	September 2002	Oregon	Community
You'd think that all the news about sardines is helping the local [Astoria] fleet - no - no local fishermen have the gear or permits to benefit from the fishery. Much of the benefit from that fishery is going out of state. [GDOP staff]	September 2002	Astoria, OR	Commercial
[Relayed socioeconomic impacts in his area.] Council needs to rectify these problems	September 2002	El Granada, CA	Commercial
Thornyheads and sablefish [were] closed this summer - it killed the Newport dory fleet.	September 2002	Newport, CA	Commercial
Work quickly [on EFPs]; the industry needs help fast.	September 2002		Commercial
Economics of fishing should be given greater emphasis.	September 2002	California	Commercial
California recreational fisheries will suffer. Economic [impacts] are underestimated.	September 2002	California	Recreational
2002: November			
Keep flatfish species in the California halibut fishery. We need every dime we can get.	November 2002	California	Commercial

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
Although the Council is primarily concerned with groundfish, and the effect of restrictions in the groundfish fleet, be aware that the West Coast fishery as a whole is experiencing an overall depression. Depressed prices for salmon, shrimp, crab and tuna are adding to the general poor outlook for fisheries. There will be a smaller fleet regardless of what this Council does, and regardless of what happens in groundfish. This proposal [fixed gear permit stacking] will provide some economic relief both to those who choose to leave, and those who choose to stay.	November 2002	Newport, OR	Commercial
2003: April			
We need real time [observer] data. Need to observe where fishermen fish [now], not where they once fished. Closing down coastal communities. We need economic analyses of port impacts.	April 2003	California	Community
Consider community effects of rebuilding plans.	April 2003	[Coastwide organization]	Community
Small trawlers are fighting to survive. If we try to go offshore, there are safety risks.	April 2003	Neah Bay, WA	Commercial
We urge the Council not to adopt this change to the CCA boundaries…especially when the effects of this kind of change under the MSA must be looked at in a balanced view considering also the social and economic impacts to members of our Association, all of whom are individual family fishermen... We have been eking out market orders by adhering to all of the groundfish conservation measures, but barely. Now, with the proposed changes to the CCA, our last few spot prawn areas would be halved...	April 2003	Santa Barbara Channel, CA	Commercial
2003: June			
[Change the bocaccio OY.] The Morro Bay economy is down 10% overall. The fishery-dependent industry is really hammered.	June 2003	Morro Bay	Community
[There has been] economic harm to the southern California sport fishery. It's a disaster. The further north you go, the greater the dependence on rockfish.	June 2003	Southern California	Recreational
Recreational fishing businesses, particularly landings and bait and tackle operations, do not benefit from the various programs designed to ease impacts of regulations on the commercial fishing community.	June 2003	Huntington Beach, CA	Recreational
Rockfishing regulations over the recent past has been dramatically affecting recreational fishing opportunities in Northern Los Angeles, Ventura, and Santa Barbara counties.	June 2003	Southern California	Recreational

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
In 1999, two landings, Hornet Sportfishing and Sea Landing, operated here [Santa Barbara Harbor]. Since then, the former has closed with no subsequent information available. Sea Landing had three sportfishing vessels available throughout the year. Now, it has one with a second available in October and November for offshore fishing... Essentially, Sea Landing had 437 fewer passengers in 2002 than 2001 for the three corresponding months (Oct-Dec).	June 2003	Santa Barbara County	Recreational
The one landing here [Ventura County] that had three vessels operating from it has closed its doors and no records are available. [A landing in Channel Islands harbor had 25.5% fewer passengers in Oct-Dec 2002 than in 2001]	June 2003	Ventura County	Recreational
Cisco's Sportfishing Landing [Channel Islands Harbor] has been in business and open 24 [hours] per day since 1964. It is the largest landing in the region… The following points are from a conversation with Marlene Wilcox, owner (Feb. 1, 2003): Lack of passengers most apparent on open party boats; overnight boats not getting out at all; [partial day] boats going light; running a two-for-one program; ... business is off a minimum of 25%; ... "The regulations in place take away any chance of making any money"; is reducing everything to stay alive; payroll has been cut in half...used to stay open 24 hours per day - now only 8-12 hours, which is the minimum necessary to stay in business; has cut all corners and still just falling further and further behind; can't pay bills; "I don't know what else to do."	June 2003	Channel Islands Harbor	Recreational
Captain Hook's Sportfishing [Channel Islands Harbor] opened in 1998 with a half-million-dollar investment… They enjoyed a 15% growth in 1999 and 2000. The downturn started in 2001, and Debbie reports that financially, her business is down 21% and between 45-55% behind on her original business model for the same time frame. ... There's been steady decline in business since May 2002. If the pattern continues or some form of relief isn't forthcoming, they'll be forced into bankruptcy. They never would have invested in the business if they had known this would happen.	June 2003	Channel Islands Harbor	Recreational

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
Port Hueneme Sportfishing reflects the same downturn in business that the others in the area show. The owner reports his November and December 2002, and January 2003, were 50% of what he did the previous year. He also reports that he experienced 50% cancellation of charters for the same three months that had been previously booked, and bookings for 2003 are running 75% behind last year. He can't make his monthly lease payments to the Harbor Department. He used to employ two part-time and two full-time employees. He has now laid everyone off.	June 2003	Port Hueneme, CA	Recreational
Booking of charters for upcoming year [is] over 20% off from last year, and last year was poor.	June 2003	Channel Islands Harbor	Recreational
New business is substantially curtailed.	June 2003	Channel Islands Harbor	Recreational
Between the 20 fm closure and island closures, where am I supposed to fish? Give us out to 30 or 40 fm or buy me out. Give me a long-term, low interest loan to fund my boats' transition to ecotourism and I'll never fish again. Right now I'm in the middle of a county sponsored engines, generator re-power that's costing me $200,000, so I can be eco-emission compliant. I'm doing this because they want me to; it's not required. While I'm doing this, other parts of government are putting me out of business.	June 2003	Southern California	Recreational
Going into savings to keep business afloat. Saltwater fishing business way off; freshwater helping to keep doors open. Sluggish economy not helping, but fishing restrictions most damaging. [Tackle shop owner]	June 2003	Southern California	Recreational
As of October 15th, bottom fell out of business. November 2002 did 50% of November 2001. December was OK. Attributes [this] to excellent fishing in Santa Monica Bay that month. Laid off an employee of five years in October (shop had three; now has two). Spent less than 50% of what he spent last year at early season trade shows. Bought store six years ago. Retired to this business and loves it. Now he wants to sell. He can't stand the political uncertainty of future. He feels victimized; has no voice. He feels nobody is really listening. [Interview with tackle shop owner]	June 2003	Southern California	Recreational

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
Sales for December 2002 not even 50% of December 2001. Worst December in 42 years of business. November 2002 and January 2003 reflect similar trends. Dealers are scared and pulling in horns. They won't spend now. Historically, the industry depended on the quality of the bite, volume of fish that migrate into the region, water temperatures that controlled how eagerly resident fish bite. Now, the business is dependent on political issues. [Interview with saltwater lure manufacturer]	June 2003	Southern California	Recreational
Business down 20% overall in 2002 as compared to 2001. Considered moving manufacturing out of state (perhaps to Mexico) to lower costs. Has cut back employees' total hours; they are all part time now. These are all ESL employees who have been with him 4 to 8 years. Historically, Fishtrap Lures has contributed and partaken in every underprivileged kids' fishing trip out there. Is stopping all of this - he can no longer afford it. [Manufacturer of plastic baits]	June 2003	San Diego	Recreational
My concern is with a small footrope I can harvest 20,000 lbs of beach fish [sand dabs, Petrale, English, sand, and flounder sole], which may sustain the markets until we are able to harvest more, but [is] not enough to operate a fishing vessel on… The only option that I can see is to fish a large footrope, which 99% of the fleet will choose to do and the market for beach fish will go away. And that market will take years to get back and will not be there if or when you ever let us catch the beach fish... I will lose my markets and be forced to fish in an area that will be over fished and unsafe for my boat over a fish I do not catch. I believe this inseason management plan will devastate the trawl industry. Markets will be lost and large numbers of boats will be forced to fish in a small area which compromises the safety of the smaller vessels.	June 2003	Crescent City	Commercial

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
We need to know what is happening with the current closure for the west coast groundfish. We are getting killed out here! When you first talked about closing the fishery…you said a two week closure…at the most three weeks. Well, we are on week four now...we still have not heard one word from the Council on how things are progressing. ... Do we all need to declare bankruptcy right now?? The appearance of discrimination against those of us that use small footropes nearshore is looking more and more as a fact. Some of us are not capable of fishing with big gear that can operate outside of 200 fathoms...you need to take that into consideration. As I write this, the large vessels continue to tow away... still making a living... they haven't missed a day of fishing. We (small boats) have been shut down for almost a month now...many of us will soon be in jeopardy of losing assets, like our homes or boats. We have already lost so much with the cable crossing, the Vessel Traffic Lane Change, and other inseason adjustments that we have no reserves left to fall back on. ...	June 2003	Neah Bay, WA	Commercial
The Council's action or lack thereof [has] real human impact. You are literally killing us off out here. ... PLEASE come up with some different restrictions for us that will still allow us to survive...we want a viable sustainable fishery that we can continue our livelihood into the future...many of us have been fishing our small family boats for generations. But sadly, many of us do not encourage our children to partake of our tradition of being a fisherman...competition and politics have put an end to that dream.	June 2003	Neah Bay, WA	Commercial
I have been told this OY [June 2003] is not large enough to allow the seasonal upward catch adjustments the fishermen need to take advantage of the good weather and strong market of the summer months. This has created a situation that threatens long established markets and infrastructure up and down the coast... We badly need to have an increase in the black and blue rockfish component of our catch allowances. Without the seasonal increases in these fish, some of the last nearshore markets will be lost along with the infrastructure that supports them. Many fishermen, especially those who fish outside of the areas that can supply the live market, cannot make enough money to support their fishing efforts...	June 2003	Crescent City	Commercial
The management regime for 2003 virtually ended groundfishing by recreational anglers.	June 2003	Southern California	Recreational

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
[We] plead the case here [Newport, OR] for expanding some fishing grounds or quotas to the draggers deploying this year, as the value of the fish the quotas allow right now would force our net shop out of business, much less a drag boat. A year from now, if these quotas and closed zones stay in effect, we will be having to turn fishermen away for fears of not being paid. Inventories at shoreside services are dwindling and the entire market infrastructure seems ready to collapse...	June 2003	Newport, OR	Fishing-related business
If we do not get back some grounds or quotas in the next couple of catch periods, I am sure there will be some fishermen dangerously close to losing their ability to survive. Look at the value of the fish that you have left us and go through the economics of running a trawler. It does not add up to viable business.	June 2003		Commercial
…We are already seeing several party boat operations being sold or forced out of business…many boats and supporting businesses (tackle shops, fuel docks, hotels etc.) depend on rockfish for winter their income. It's not a large part of their annual total but enough to pay their employees, insurance and berthing fees until the more lucrative salmon season opens. We are literally one bad salmon season away from losing most of the party boat operations along the Central coast. In a good salmon season these small businesses can scratch out a living but if the salmon don't show the cost of running a boat and paying its crew becomes impossible. Most at risk are boats and businesses in the smaller ports. Two of the largest party boat operations in Bodega Bay are currently selling out or closing down and more are sure to follow from Ft. Bragg to Bodget Bay. ...A blown motor or other major breakdown can cost upwards of $40,000 and quickly force the owner to sell out or into bankruptcy.	June 2003	Central California	Recreational
I and others had been able to maintain a sustainable [live fish] fishery as well as keep a successful business - with employees! That was when we were allowed to fish all year (with quotas) and target more than one species. Now, we have been regulated to fish only four months of the year! And the license fees are going up! With more licenses! (Deeper nearshore rockfish - a cruel slap in the face to nearshore fishermen not levied on the sportfishing fleet). This situation is unacceptable to this open access participant... Regulations are putting me out of business, by a conspiracy of anti-fishing management staffing... Something must be done to put the commercial fishing industry back to a common sense, profitable state. ...	June 2003	San Diego, CA	Commercial

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
…These current species, area and seasonal limitations will, in a relatively short time, cause the ultimate demise of the sportfishing industry. We have already realized a significant decline in our passenger loads and revenue since the most current stringent closure went into effect, i.e. [the] sculpin closure (March 1). This closure, in conjunction with the ongoing whitefish restriction, the "non-opening" for any species of rockfish and the 20 fathom...depth limitation have all contributed to what can only be described as a catastrophic situation for the sportfishing industry in southern California. A lack of catchable species is now being recognized by our attending and prospective customers and their interest and participation is at an all-time low for this time of year.	June 2003	Balboa, CA	Recreational
…The net result…of the closures has been that the sportfishing industry is now crippled by the limitations of allowable catch which has had a devastating effect on our potential customers' participation in the fishing activity. In other words, people are not going fishing because they can keep next to nothing that they catch! To pay to go fishing is not money well spent since the trips result in something more akin to simply a "boat ride."	June 2003	Balboa, CA	Recreational
Over the past 50 years of recreational sportfishing, we have been able to offer our customers a variety of species in the winter and spring months. Since migratory species, such as tuna, yellowtail, barracuda, etc., are not in our area during these months we have relied on whitefish, sculpin and rockfish (groundfish) as the mainstay of our trips. Needless to say both winter and spring seasons have been disastrous in terms of participation and catch due to the fact that we are unable to fish for any type of groundfish other than sheephead.	June 2003	Balboa, CA	Recreational
The demise of recreational sportfishing will also have a severe economic impact on those who derive their livelihood from sportfishing. Those who will be affected directly include boat and landing owners, captains, crewmembers, bait haulers, landing office personnel, etc. The businesses indirectly impacted would be tackle providers, fuel docks, boat maintenance and repair facilities (shipyards), manufacturers of fishing electronic equipment, vessel food and beverage vendors, and the list goes on.	June 2003	Balboa, CA	Recreational
2003: September			
If trawling is closed for three months, the filleters I have would have to get a new job; the truck drivers would leave, and I'd be out of business. It's that serious and that simple.	September 2003	California	Processing

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
If we implement this observer data inseason, it's not only going to shut down the trawl fishery; it's going to take the fixed gear fishery also. In Southern California, with the Cowcod Conservation Area, Rockfish Conservation Area, deeper nearshore permit, nearshore permit, marine sanctuary, whatever, we're running out of stuff to do. And we can't afford to lose this fishery... if we implement this data, it's going to kill us.	September 2003	Southern California	Commercial
Changing the process again, midstream…is taking all these small [trawl] businesses by surprise, and will hurt many coastal communities. …How do us small business owners tell our bankers that our government's inseason adjustment has ruined our business plan for the year? How can any business effectively operate in this kind of environment?...	September 2003	Coos Bay, OR	Commercial
I think a lot of this…is centered on biology rather than thinking about the fishing community… Fishing, fishermen, and fishing communities are all businesses… Communities should be considered. There are a lot of rural communities out there…that are all hurting. This closure could really impact rural communities, if not devastate them. Socioeconomic and drastic impacts must be considered in this decision. Businesses depend on a yearly revenue cycle to make decisions...an inseason adjustments makes no business sense... I can't fathom making decisions every two weeks in another kind of business...	September 2003		Commercial
If this season is shut down, the economic effect in Port San Luis, Morro Bay, and San Luis County in general is gonna take a real hit. The only processor in Port San Luis…will be out of business… There are approximately 15 trawl vessels that will be out of business in both ports...	September 2003	Port San Luis and Morro Bay, CA	Commercial
In terms of some of the economic impacts…In Warrenton, Oregon, last year...in period 6 (teh whole period that would be closed under on scenario here) the exvessel gross averaged about $60,000 per vessel for the trawl fleet. There are about 30 vessels fishing in Warrenton, so that comes out to about a $1.8 million impact. And if you use a conservative...multiplier (2.5), that's about a $4.5 million impact on the community of Warrenton.	September 2003	Warrenton, OR	Commercial
Please consider alternatives to protect fisheries who have taken drastic measures in their commitment to save and conserve fish. These changes create scenarios where fishermen cannot function as a business.	September 2003	Central California	Commercial
[Only 28 of 545 metric tons of shortspine thornyheads are caught in Washington]. You're now taking somebody who's not creating a problem, and trying to put us out of business. I don't understand…	September 2003	Neah Bay, WA	Commercial

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
The effects of a total closure could be pretty devastating to some people, and given the doubts about the science that's being used, I think you need to weight that very carefully.	September 2003	Fort Bragg, CA	Commercial
… One of my landings, Cisco Sportfishing, is out of business, bankrupt, because of the closure of the rockfish fishery.	September 2003	Southern California	Recreational
Keep the B platoon; it helps the industry. The trawl industry is on its knees.	September 2003	Oregon	Commercial
If areas outside of the 50 fm line are closed to recreational anglers, we would not have any opportunity to fish for groundfish [due to unique geology of area.] Recreational angling provides a great economic stimulus for Winchester Bay and the surrounding area. If recreational angling were stopped, we would experience the ripple effect from another loss of fishing species. We experienced this in the 80s and 90s with the closure of coho salmon fishing along the Oregon coast. Many fishing related businesses closed and this area lost all our charter fishing businesses. We currently have only four charter offices providing offshore angling opportunities for our visitors. [Received 2 copies from different people]	September 2003	Winchester Bay, OR	Recreational
The Port of Siuslaw [Florence, Oregon]…is greatly concerned about any pending recreational groundfish closures outside of the 50 fm line… We do not have any coastal reefs that support groundfish. The closest reefs to Florence are at Heceta Banks thirty miles offshore...Recreational angling provides a great economic stimulus for Florence and the surrounding area. If recreational angling for groundfish were stopped, we would experience the ripple effect from the loss of fishing. We experienced this in the 80s and 90s with the closure of coho salmon fishing on the Oregon coast. Many fishing related businesses closed and we lost all our charter fishing businesses.	September 2003	Florence, OR	Recreational
2003: November			
Closing the [sanddab fishery] makes it hard to pay for VMS.	November 2003	California	Commercial
I would catch 30% of what I could if forced out to 200 fm.	November 2003	California	Commercial
We are writing on behalf of Forks, Washington…to support the proposed changes to the Pacific Halibut Catch Sharing Plan… Our community has been struggling with a declining economy for the past fifteen years. We have been actively pursuing methods to improve all aspects of local commerce, including recreational fishing impacts. ... [Changes to the catch sharing plan] would greatly benefit the Washington North coast communities.	November 2003	Forks, WA	Recreational

Comment	Council meeting	Community impacted (when noted)	Sector (when noted)
The Quileute Tribe at LaPush, Washington is writing in support of the letter you have received from the City of Forks…Like Forks, our community has been struggling financially for many years. Having the only major recreational harbor for many miles, recreational fishing is extremely important to us as well. ...	November 2003	LaPush, WA	Tribal
2004: March			
Please don't push me out into 120 fm. It's not going to help the yelloweye, and it's going to be very hard on my economics.	March 2004	Port Angeles, WA	Commercial
I was talking to our harbor manager, and he says he's facing some revenue cuts. How do fish businesses…[recreational boats], processors, buyers, restaurants, fish markets, how do they function and pay taxes and keep the port working if they're not allowed to catch their allocated OY? How do they do their financial planning? Some folks are considering marketing campaigns [to sell] the fish that are caught - to get the highest value added, and certain marketing campaigns go out - and then all of a sudden the season's closed, and people have spent a great deal in marketing their fish... or in the case of the recreational fishermen, putting out ads for their season...	March 2004	South/Central California	Commercial
Sport fishermen come to the coast, rent a hotel, eat dinners out, buy tackle at the local shop, get their boat serviced/repaired in town… who supports the local economy more with the least impact on fish stocks???	March 2004	Oregon coast	Recreational
It seems strange to us that the hardest hit west coast fleet is the only U.S. fleet to have to pay for [VMS]… The state that has the highest unemployment rate, the state with the highest poverty level, the state with the most strict and radical regulations in the world and the state with much less powerful Senators has to pay for the system themselves. We now are forced to fish beside vessels who are using government paid for VMS units while we have to borrow money to pay for them. ...	March 2004	Coos Bay, OR	Commercial

2004: April			
… It has…come to the attention of Arrowac Fisheries that this depth management fisheries approach may result in the fishing depth restriction being moved to 150 fm perhaps as early as June. This depth restriction will be financially devastating to Arrowac Fisheries Inc., [its] employees...and the fishermen who derive their livelihood from the longline fishery off the coast of Washington. It appears the tradeoff for this devastation of the local economy would be to enable the Council to find additional rockfish bycatch biomass to be allocated to another user group... Arrowac Fisheries depends heavily on the dogfish harvest...moving the depth restriction to 150 fm would virtually eliminate the harvest of dogfish...[we also depend] on the set line blackcod fishery that takes place off the Washington Coast. With a depth restriction of 150 fm...an additional negative economic hardship would be experienced... Most likely Arrowac would see a reduction in blackcod pounds delivered...generating less dollar return and reduced work hours...	April 2004	Bellingham, WA	Processor
With respect to the blackcod fishery of the Washington coast the real negative economic impact would be borne by the setline fishermen. Moving the depth restriction to 150 fm would result in the harvest of small blackcod, generating an average revenue of about a dollar less per pound...	April 2004	Bellingham, WA	Processor
… I represent the LaPush Area Recreational fisheries in the North of Falcon and PMFC process. …We are extremely concerned about the lack of regional management…There is no fairness in allowing one state's excessive catch to preclude fishing in the other states. Groundfish fisheries are critically important to our coastal economy and tourism.	April 2004	Forks, WA	Recreational
Our city has been severely impacted by the decline of the groundfish. … The current system appears to favor other states over Washington.	April 2004	Ilwaco, WA	Community
…I represent the Ilwaco Charter Association. … We are extremely concerned about the lack of regional management on weak groundfish stocks… Groundfish fisheries are critically important for our coastal economies.	April 2004	Ilwaco, WA	Recreational
…The 30 vessel owner/operators that are members of our association depend upon groundfish and halibut for a major part of their livelihood. …[A call for regional management]	April 2004	Westport, WA	Recreational
…I am writing on behalf of Southwest Washington Anglers. … These various fisheries are of extreme economic value to our small coastal communities. [A call for regional management]	April 2004	Oregon and Washington	Recreational

… The Port of Neah Bay has invested heavily in the newly constructed Makah Marina and additional upland facilities that both support and are reliant on the recreational fisheries. A vibrant groundfish and halibut fishery are critically important to Neah Bay's economy, as it is to other coastal communities relying on recreational fishing to survive. We are extremely concerned about the lack of regional management...	April 2004	Neah Bay, WA	Recreational
2004: June			
[California recreational fishery] needs a 10 month season to survive. About to lose [my] business.	June 2004	Southern California	Recreational
This [black rockfish] closure hurts California economically and socially while it does nothing to protect California's environment.	June 2004	McKinleyville, CA	Recreational
I believe you are completely wrong in recommending the closure of the bottom fishing season with all the implications for people who depend on the sea for their food and income…When you close the seasons as you often recommend, it puts an extreme hardship on businesses and their employees.	June 2004		General
2004: September			
All over Oregon, our skippers and deckhands depend on the ground fishery to make a living and feed their families. Winter months through early Spring especially, all they were allowed to catch was bottom fish, to carry them through until salmon season starts again. This is the cycle you have put us in. Now you have ruled to take this away from us leaving nothing to make a living with this winter. How can you sleep at night??? ... Your inaccurate estimates are interfering with peoples' lives and should be stopped. We have all worked with you, allowing observers to go out on our boats (no charge) and fish checkers to come down to our privately owned docks, to help them do their job. How and what would they feel and you, yourself, if we say - no more!!! ...Give us back our fishing rights.	September 2004	Newport, OR	Recreational
As the news of the sports ground fishery closure moves like a storm through Brookings Harbor, numerous individuals have contacted the Port… The impact is being felt already by this community and is expected to multiply extensively in the next few days. Southern Oregon is struggling to create employment opportunities and keep this one key element of the tourism industry alive, which is our recreational fishing industry. This is a blow to our economy that is unexpected and, plainly speaking, should be justified to the general public, as each of our fishermen knows very well that there is a tremendous abundance of groundfish available in this area.	September 2004	Brookings, OR	Recreational

This [sport groundfish closure] will require that I cancel all my trips and let my customers also cancel all hotel and dinner plans for October and November of 2004. … I will now plan on leaving the northern Oregon coast upon the closure of the 2004 salmon season. ... It is sad that the few commercial interests far outdistance the revenue generated by public visiting and spending tourist dollars in these hard hit local coastal towns.	September 2004	Sammamish, WA	Recreational
[VMS] will force small vessels with limited income out of the fishery.	September 2004	Pacific City, OR	Commercial
2004: November			
[Wants specific Petrale areas opened.] Petrale is important to the limited entry trawl sector. [We] may not survive a closure. [My] career is probably over without a Petrale season.	November 2004		Commercial
The fall Petrale sole fishery has been a valuable economic asset to both the fishermen and processors at a time when both the weather and the late year limits put an economic hardship on the industry. By the current position of the 250 fm line the Petrale fishery has been eliminated. The Petrale fishery has become an established holiday season marketing item for the processors, brokers, wholesalers, restaurants, and grocery stores. We all traditionally look forward to this unique fishery opportunity, over the past years, to sell the best available sole we have to offer our customers and the general public. The loss of income produced by this fishery will not only affect the fishermen, their crews, and processing community, but the coastal communities as well.	November 2004	Charleston, OR	Processing
…Without proper notice the RCA zone was moved out to 250 fm, which causes a devastating ripple effect within our company. Over the past several months our company has invested approximately $80,000 to develop our new fillet room with the anticipation of Petrale season opening in October of this year. We are a small company just starting out in this business and this has made an enormous impact on our financial situation... Last year during the months of October, November and December we purchased several thousands pounds of Petrale, which made it possible for us to continue doing business by compensating enough income to keep paying wages of our employees. Currently we employ 11 employees...in the fillet room; if we continue to lose the upcoming months of Petrale season this number will dramatically decrease, leaving our employees without jobs. In order to help with Petrale season we also employ additional dock crew [and a supervisor].	November 2004	Charleston, OR	Processing

Taking away access to Petrale...obviously affects more than just the fishermen. It affects many jobs...and it has already taken a serious toll on our small company... By moving the RCA zone we have also lost access to rex sole, English sole, sanddabs, and shallow water dover, which is a smaller market but still provides income to local families that our company employs.	November 2004	Charleston, OR	Processing
2005: March			
Since a seven month recreational groundfish season in 2004 did not result in a catch exceeding the target harvest, it is difficult to understand why our fishing season has been reduced to four months in 2005. … Because the reduction in our groundfish season will have a devastating impact on our port and local community, and because we have significant new information indicating the reduced season is neither justified nor needed, the Board of Harbor Commissioners of the Crescent City Harbor District respectfully requests that you open the season for recreational rockfish on May 1 and allow it to remain open until October 31.	March 2005	Crescent City, CA	Recreational
Port Orford fishermen, the Port and the community of Port Orford have long derived economic benefit from groundfish landings from around our area. All are now suffering hardship because of declining stocks and harvest regulations. [Request for TIQC to consider fixed gear vessels and keep Port Orford informed.] We believe any groundfish planning should include all gears and harvesters and provide information to communities and a process for communities to participate in the decision-making that will affect their futures.	March 2005	Port Orford, OR	Commercial
2005: April			
…Blackcod fishermen will be affected [by VMS requirements]. It's going to be a situation where, according to this economic information, which may or may not be true, there's over a million dollars being brought in by those fishermen in our northern area. I don't believe there's been a multiplier applied to that to tell you what the true value is to our communities; it would be at least three times that much. ...I see the VMS being a much larger economic issue than what is being presented to you...	April 2005	Crescent City, CA	Commercial

In 2004 the [California] Department of Fish and Game cut our fishing season to seven months, with this shortened season Crescent City and Del Norte County suffered some tourism and revenue losses that year. In 2005 the CDFG cut our season to just four months...with the offshore weather we have here at Crescent City in the summer, the season will be less than [four months]...This is pure and simple economic damage caused by the federal government to our small community. This county cannot afford to let this continue. ...	April 2005	Crescent City, CA	Recreational
… I have a lot of friends here in Crescent City that fish the ocean waters, this year they are all taking their business to Brookings, Oregon. As you know, tourism is the largest part of Del Norte County's revenue, this county can not afford to let this continue, Crescent City used to be a destination point, not so these days, every business in Crescent City will lose more revenue this year than they did last year, it will be the same in 2006 with another four month fishing season if they're not stopped...	April 2005	Crescent City, CA	Recreational
The recent development of the recreational groundfish regulations is of much concern to the City of Crescent City and its residents. As you know, we have a deep and strong interest in both the commercial and sport fishing activities in our area. Any reduction in this season would have a detrimental effect on our economy and way of life.	April 2005	Crescent City, CA	Community
I am a charter boat owner/operator that operates out of Port Hueneme CA. I am writing to convey the urgency for more groundfish opportunity when you are considering inseason adjustments… I ask the members of the Council to consider the fact that I have been driven to near bankruptcy by the extremely cautious approach you have taken in regard to this so-called groundfish crisis. Me and many others that rely on groundfish to survive have been mentally and financially torched by the MRFS data...	April 2005	Port Hueneme, CA	Recreational
…I own and operate the Seabiscuit (CPFV) out of Channel Islands Harbor… We have been regulated and pushed into shorter bag limits, depth restrictions, tackle cut backs, and an extremely short rockfish season in 2005. The toll of these regs have pushed many of us to borderline bankruptcy. Many of us depend upon groundfish to survive. We have been crippled by the extremely conservative approach... many of our livelihoods may lie in the balance of the Council's decision...	April 2005	Channel Islands Harbor, CA	Recreational

2005: June			
There are many small ports and harbors that have mutually beneficial relationships with fisheries industries, both sport and commercial, within the [EFH EIS] study region. These small craft harbors rely on the fisheries to provide steady jobs and act as an economic engine to keep the community vibrant. In the case of several central California harbors, the past few years of increased regulatory actions have had a drastic negative effect on the ability of the fishing fleets to continue making a profit, which has a direct effect on coastal host community (harbors and marinas). The implementation of yet another...closure will have a great economically adverse effect on these local communities...	June 2005	Moss Landing, CA	Community
There is a synergy that occurs which is unmeasurable in terms of cash value that needs to be considered in the development of fishing regulations, including the designation of essential fish habitats on the west coast. The public comes to the ports and harbors and enjoys getting their fresh seafood while watching the boats offload their catch. Without that, these small craft harbors become stagnant and turn into yacht harbors for the rich. The little guys are forced out and the working harbors cease to exist. We have seen this in southern California harbors and hope that that does not happen here. ...	June 2005	Moss Landing, CA	Community
There are many small ports and harbors that have a symbiotic relationship with the fisheries industries, both sport and commercial, within the [EFH] EIS study region. These small craft harbors rely on the fisheries to provide steady jobs and act as an economic engine, keeping the community vibrant. In the case of central California harbors, the past few years of increased regulatory actions have had a drastic effect on the ability of the fishing fleets to continue making a profit. This decline, in turn, has had a direct effect on coastal host community (harbors and marinas). The implementation of regulatory closures or restrictions will have a deleterious economic effect on these local coastal communities...	June 2005	Port San Luis, CA	Community

There is a synergy that occurs which is unmeasurable in terms of cash value that needs to be considered in the development of fishing regulations, including the designation of essential fish habitats on the west coast. The public visits the ports and harbors and loves to get their fresh seafood while watching the boats offload their catch. Without community interest, these small craft harbors become stagnant and turn into yacht harbors for the wealthy, or marine malls selling plastic sharks and T-shirts. The small independent business persons (fishermen) are forced out and the working harbors cease to exist. We have seen this in southern California harbors and hope that that does not happen here. ...	June 2005	Port San Luis, CA	Community
[Comments on EFH EIS]: Consideration of the buyout program and the unintended effects to the local harbors should be considered and offset with mitigation measures to insure the continued infrastructure is in place, new markets are explored, funding for new shore side fisheries support facilities are provided and the economic synergy is maintained for the shoreside businesses in the local coastal communities.	June 2005	Port San Luis, CA	Community
…The extreme weather combined with the extreme and rapid harvest controls have made a large portion of the traditional groundfish fisheries economically unviable for the dominant sport charter fleet and small scale fixed gear rockfish fleet.	June 2005	Santa Barbara, CA	Commercial
Status quo here means a continuation of heavy management measures while the resources continue to rebuilding. For the trawl fleet, this has meant: fleet reduction via the buy-back program; prohibited large roller gear use…[other gear restrictions]…forced to carry observers for data collection activities; coerced to operate under "house arrest" with the unfunded mandatory VMS program; forced to develop the RCA and boundary modifications; engaged in collaborative research to help improve the science; current development of ITQ program to reduce discards with industry funding; reduced time on the water by 75 to 80 percent; reduced our earnings by at least 75%.	June 2005	Coos Bay, OR	Commercial
Fishermen feel that the Council is operating in fear of environmental group lawsuits and are willing to sacrifice every coastal community to appease them… The fleet in particular has made the most extreme sacrifices to ensure a healthy sustainable resource... It's our community's jobs at stake, not NMFS', that these environmental groups are willing to sacrifice. The nation needs to address the frustration level environmental groups are placing on our fishing communities. The nation needs to weigh the stress these groups are placing on our hard working families...	June 2005	Coos Bay, OR	Commercial

Under options C13 and C14 [of the EFH EIS], the area designated as it is would have devastating effects on the rest of the commercial and recreational fleets in both Coos Bay and Bandon as well as both ports. The Port of Bandon strongly urges the Council to revisit this map and remove the hard bottom designation that we were singled out with.	June 2005	Bandon, OR	Community
Many [of the alternatives in the EFH EIS] have large economic impacts to the downside on fishing sectors and communities.	June 2005	Oregon	Recreational
The City of Morro Bay treasures its fishing heritage and local commercial fishing fleet that provides fresh seafood for this country in a highly regulated and sustainable environment. Our harbor and its commercial fishing businesses depend on groundfish landings to support the harbor infrastructure, since many of our fishermen are mainly albacore, crab or salmon permittees with actual landings in the ports north of Morro Bay. Our City has suffered from the reductions in groundfish quotas, seasonal restrictions and area closures to the extent that the local groundfish market has almost collapsed and just a few of the traditional shore side support businesses are still hanging on.	June 2005	Morro Bay, CA	Community
Currently there are 5 Class A permittees who operate out of our port… Each Class A permittee generally fishes between 5-8 days to make up their 60 day quota; so on most of the days of the year there is no longer even one deep water complex trawler operating on this two hundred miles of coastline. Yet, the port still does get groundfish, and these are the consistent landings that allow our one remaining full service fish buying dock to keep employees working and pay the bills. The City is dedicated to supporting this remaining fish buying dock...	June 2005	Morro Bay, CA	Community
Clearly the policy of subsidizing more and bigger trawlers in the 1970s was a disaster, but just as clearly the resource for 15 years now has been very lightly harvested compared to historic levels. Many of our local restaurants no longer can get local fresh fish and have turned, like most of the country, to frozen fish which is oftentimes harvested in environmentally damaging ways in unregulated countries.	June 2005	Morro Bay, CA	Community
In the last two years we have seen some hope as groundfish prices have gone up a little, quotas increased slightly, (but typically not what was promised) due to the federal buy-back program and Class A permittees have started to see a reasonable economic return for fishing again. We are hopeful that some uncertainty can be relieved for these local businesses and for the City.	June 2005	Morro Bay, CA	Community

Many of the alternatives in the [EFH] DEIS would appear to close fishing grounds to the extent that would eliminate landings in Morro Bay and finally put an end to our commercial fishing harbor. We do not believe it is the intent of [NMFS] to eliminate fresh seafood landings in our area and decimate our City...	June 2005	Morro Bay, CA	Community
Extend the timelines for adoption of groundfish EFH so that the coastal communities/fishing industry can fully engage the discussion with NMFS and the environmental community. Improve the outreach to community and fishing businesses by considering an ombudsman program, enhancing your sustainable fisheries outreach effort or some mechanism to empower local fishermen to give input and build trust with NMFS and the environmental community.	June 2005	Morro Bay, CA	Community
I would close by pointing out that virtually 100% of our commercial fishermen are owner operated small businesses. We don't have the corporate interests that can hire lobbyists… It is tremendously difficult for a small business owner/operator or a small city for that matter to take the time to become informed on these issues, much less to attend the many meetings that are needed to have an impact. Thus are voices are often not heard or we find that decisions are made at meetings we are unable to attend. ...All of the above facts lead to a feeling of lack of empowerment and even distrust of the process...	June 2005	Morro Bay, CA	Commercial
Any viable economic analysis of minimization measures should include not only the short-term direct costs of management measures, but also the long-term costs of continued habitat damage, as well as the long-term benefits of habitat protection.	June 2005	[Organization]	Environmental
With the array of closures already implemented along the California coastline, a significant concern relates to the cumulative impacts of these closures on the essential infrastructure required to sustain viable commercial "working" fishing ports and harbors along the 1,100 mile coastline of California. ...Which additional layer of no-fishing regulation will cross the threshold of cutbacks to the number of boats required to harvest a sustainable yield from California's ocean resources, the number of buying stations still left in Morro Bay, San Pedro or Santa Barbara Harbors, the number of fish processors and/or retailers that can keep their doors open in order to serve the remaining few fishing boats that still go out? The cultural value of working ports and harbors is measured in both cultural heritage and tourism value: it is common knowledge that what attracts tourist dollars to the Morro Bay or Santa Barbara Harbor is "the quaint fishing boats" that still number in the tens, at least, in each harbor...	June 2005	Southern California	Commercial

At some point, an additional regulation will be the last one necessary to remove the infrastructure, more or less permanently (due to the failure of the commercial fishing industry to recruit young people among its numbers), that supports this cultural heritage in California ports and harbors. It behooves the Council to carefully consider whether or not further draconian measures are actually required to effectively protect groundfish EFH, or whether these further measures are, in fact, "the last straw" for fisheries culture and infrastructure in these ports and harbors. ...How much fishing area, how many fishing boats, are necessary to maintain the year-round sustainable infrastructure of buying stations, ice houses, hoists, fish processing plants, wholesalers and retailers, that can provide fresh California seafood to seafood consumers?	June 2005	Southern California	Commercial
[Pacific Marine Conservation Council] believes that NOAA Fisheries' outreach in coastal communities with regard to the [EFH] DEIS should have been more extensive. Additional constructive input from people who make their living on or near the water would have resulted in a more comprehensive EFH EIS, and in superior protection of sensitive marine habitats with minimal impact on fishing communities.	June 2005	[Organization]	Community
PMCC has consistently testified to the Council that we believe that it is important to assess whether disparate adverse economic impacts may accrue to individual communities if important opportunities are lost due to restricted access. NOAA Fisheries can determine this to some degree using economic and spatial effort data regarding the trawl fishery, but it remains essential to engage fishermen in this process.	June 2005	[Organization]	Community
A healthy Pacific Ocean is crucial for our way of life including our economy and recreation. For more than three years, Oceana has been bringing science and information to the PFMC and NOAA regarding the importance of protecting deep sea corals and sponges from bottom trawling. I support protecting ecologically sensitive areas of the Pacific seafloor such as corals and sponges, and special places such as seamounts, biogenic areas, and deep sea canyons from destructive commercial fishing. As you consider the [EFH EIS], please adopt a management alternative that protects habitat and maintains vibrant fisheries.	June 2005	Form postcard (755 comments)	Environmental

A healthy Pacific Ocean is crucial for our way of life including our economy and recreation. For more than three years, Oceana has been bringing science and information to the PFMC and NOAA regarding the importance of protecting deep sea corals and sponges from bottom trawling. I support protecting ecologically sensitive areas of the Pacific seafloor such as corals and sponges, and special places such as seamounts, biogenic areas, and deep sea canyons from destructive commercial fishing. As you consider the [EFH EIS], please adopt a management alternative that protects habitat and maintains vibrant fisheries.	June 2005	Form postcard (8,266 comments)	Environmental
...Pacific groundfish are in trouble. Years of heavy fishing have taken their toll so that today both the fish and the fishermen are suffering. We must take steps today to restore our oceans so that our marine wildlife and our fisheries can thrive in the future. Protecting EFH is one of the most important steps on this path. ...	June 2005	Form email (382 comments)	Environmental
A healthy Pacific Ocean is crucial for our way of life including our economy and recreation. For more than three years, Oceana has been bringing science and information to the PFMC and NOAA regarding the importance of protecting deep sea corals and sponges from bottom trawling. I support protecting ecologically sensitive areas of the Pacific seafloor such as corals and sponges, and special places such as seamounts, biogenic areas, and deep sea canyons from destructive commercial fishing. As you consider the [EFH EIS], please adopt Alternative 12, which protects habitat and maintains vibrant fisheries..	June 2005	Form email (18,529 comments)	Environmental
A healthy Pacific Ocean is crucial for our way of life including our economy and recreation. A key to keeping the Pacific Ocean healthy is the protection of marine habitat necessary to support its diverse assemblage of ocean life... As you consider the [EFH EIS], please adopt a management alternative that protects these ecologically sensitive habitats necessary to maintain vibrant fisheries.	June 2005	Form email (58 comments)	Environmental
Closing the [recreational] bottom fishing in the warm months would not impact the industry nearly as bad as closing it in the cold months. The sportfishing landings are suffering, trying to find anything to fish for during the winter months with the closures to bottom fishing. ...	June 2005	California	Recreational

In the middle of listening to all the rhetoric regarding the implementation of the [Marine Life Protection Act]…we receive your notice of further attacks on the fishing community. Honestly, does anyone consider that if this continues we will be importing all our fish from disease ridden fish farms, or unregulated fisheries of foreign countries. California has vast resources that are being wasted...Many fishermen are going out of business, there was a 50% reduction in fishermen just in our local Morro Bay community. We lost our local weather buoy and weather station recently with no effort to replace them. I feel the state/feds are too biased towards the environmental community and letting the fishing communities die on the vine. Ten years from now, after the current older fishermen retire, there will not be commercial fishing in California at the rate we are going because it will be economically impossible to survive, but maybe that is what everyone seems to want.	June 2005	Morro Bay, CA	Commercial
I am writing because a healthy Pacific Ocean is crucial for our way of life, which includes our economy and recreation. [Support for Oceana's efforts] … As you consider the EFH EIS, please adopt Alternative 12, which protects habitat and maintains vibrant fisheries.	June 2005	New York, NY	Environmental
It is not acceptable to close habitat areas to all fishing because some types of fishing have little or no impact on the habitat. Option C.3.1 or C.3.2 is a much more rational approach to the problem, and would have the least economic impact on the coastal communities. Alternative D3 - this could be the economic straw that breaks the back of the small vessel operators. The impact of these vessels is minimal or nonexistent, but more people work on the small vessels than on the larger ones in this area. Do you really want to put all those people out of work? Do you really want to turn off the lights of the small coastal communities? I know the main thrust of this draft proposal is environmental, but I would like to remind you that Homo Sapiens is also part of the environment...	June 2005	Newport, OR	Recreational
We have experienced some huge changes in the last few years. We have seen the bottom fish fleet reduced and their area reduced drastically. …I think it is time for the industry, the Council and the environmentalists to stop making rules that will harm the fishing community. ...	June 2005		Commercial
The economic impact these closures would inflict to the coastal economies will be devastating. The demise of the commercial industries have already made a mark on the coastal community and caused them to focus more efforts on sport fishing. The closures proposed would kill not only the local fishers but also the thousands and thousands of tourists drawn to the area for that very reason. ...	June 2005		Community

I respectfully recommend that your office consider the economic disaster of imposing these new unproven regulations on the coastal communities that thrive on tourists visiting and recreating in these public areas. … I believe [NMFS] needs to better evaluate the impacts of these proposals and preserve fishing opportunities for future generations of anglers. I also believe that this plan is an economic disaster waiting to happen to the already economically depressed coastal communities.... I for one will review my monies spent on the Oregon Coast and all the clients that I draw to the coast to fish the waters off Oregon and Washington. I will better manage my assets and tax dollars and reinvest in areas that are not impacted by these inappropriate regulations.	June 2005		Recreational
… There are not huge numbers of sport fishermen, but the numbers represent a much bigger number of visitors to the coast of Oregon to do other activities. If the fishing is restricted unnecessarily, it will have a large negative impact on the economies of the coastal towns that are already in poor economic condition...	June 2005	Longview, WA	Recreational
…The (positive) economic factors in rural communities should be given priority.	June 2005	Shelton, WA	Recreational
Please do not continue to bow to special interest groups who are pressuring you to consider marine sanctuaries. This is the last thing we need on the west coast to continue our economic slide into oblivion. … I would urge all of you to think this proposal through carefully and weigh the ramifications both economically and recreationally...	June 2005	Portland, OR	Recreational
… Sport fishing has been the lifeblood of many small communities along the Oregon coast and represents a substantial infusion of money to local and the state economy… Please take into account when you consider the current closure proposals that the sport fishing fleet does represent a major influence on the economy and does virtually no harm to the ecology or the fishery.	June 2005	Oregon	Recreational
Under Alternative C.12, C.13 and C.14 there is only one near shore area listed for Oregon… This area is rarely trawled… but this area is the only area available to recreational groundfish fleet and a small number of hook and line groundfish commercial vessels. Alternative C.13 would eliminate those fisheries, a real blow to Coos Bay and Bandon. Alternative C.14 would also cut out a large portion of very productive salmon trolling grounds out of Coos Bay and Bandon. A double blow to the communities. ...	June 2005	Coos Bay and Bandon, OR	Commercial

In our area, where groundfish are particular important, the fishing industry is already hurting and has been in serious decline for years. Overfishing and the use of bottom trawl nets and other heavy fishing gear have depleted fish stocks and caused much damage to the marine habitats the fish depend on... Effective measures to protect those critical habitats and to regenerate and restore fish populations are essential if commercial fishing is to have a future here along the Pacific Coast. ...We believe that an ecosystem-based management plan that truly protects the long-term health of the marine environment offers the only promise for the future of fishing here on the West Coast, both as an important local industry, and as an essential economic resource for the country as a whole.	June 2005	Bandon, OR	Commercial
For many years, a large percentage of my income was derived from fishing vertical gear for chilipepper rockfish, working from about the Cordell Banks to the Channel Islands; that fishery is now virtually closed to me forever. In order to replace this lost income, in recent years I have fished the same type of vertical hook-and-line gear for blackgill rockfish...The only fishing grounds accessible to me [from Morro Bay]...is the Santa Lucia Banks. I have already been displaced from all closer grounds... Please do not close the last place I have left to fish this highly selective gear type.	June 2005	Morro Bay, CA	Commercial
…Since most sportfishing probably does have less impact than most commercial fishing, and in many cases an equal or greater community economic impact, it seems clear that one way to minimize the impact on EFH would be to allocate more fish to sportfishers. This would have the added benefit of extracting a greater economic benefit from the limited allowable catches of some of the more constraining species of groundfish. ...	June 2005	Oregon	Recreational
Being a lifelong resident [of Seal Rock, OR]…means I realize the importance of fishing to this community. However, I am also aware that no single species can be lost without contributing to the loss of another, eventually impacting the very quality of human life that we are all eager to maintain. ...	June 2005	Seal Rock, OR	General
The base years of 2000-2002 are questionable measures of fishing. One must remember that the fishery in those years was already significantly impacted by trip limits and area closures. In fact the entire west coast trawl fishery is much different today than in the past. Since 1994 75% of trawl effort has been removed by limited entry permit retirement, vessel buyback program and migration of part of the fleet to Alaska. ...	June 2005	Toledo, OR	Commercial

As a retired marine ecologist, I'm aware that, for decades, protection, even when intended, has fallen victim to more immediate economic pleas from fishermen. Please do protect the habitat of groundfish and manage the resource for the long run. …	June 2005	Eugene, OR	General
The fishing heritage of central California's harbors is iconic, inextricably woven into the state's history and culture. Moreover, this heritage is alive today--commercial fishing and working harbors provide significant benefits to society, including fresh seafood, tax revenue, tourist attractions, economic benefits that ripple through coastal communities, and a strong voice for conservation (e.g. opposition to pollution). Commercial fishing in this region has a long and colorful history and creates a culture worth sustaining for its own sake. Some communities have been almost entirely dependent on fishing for generations. But California's fishing heritage is at risk.	June 2005	[Organization]	General
Starting in the early 1990s, fishing opportunities for west coast groundfish…have become increasingly constrained as a result of reductions in total allowable catch. Efforts to keep the fishing open year-round resulted in reductions in smaller and smaller trip limits, making it difficult for fishermen to make a living, and for ports to maintain revenues. The establishment of very large areas closed to rockfishing resulted in further economic distress. As a result, the working harbors of the central California coast have become fragile - their health linked to declining fish landings and revenues. ...[Presented goals of the Fishing Heritage Group and consensus map of no-trawl zones]	June 2005	[Organization]	General
The Del Norte County Board of Supervisors has been approached by the near-shore sport fishing community concerning shortened sport fishing seasons ordered by the PFMC. The public expressed frustration and concern regarding the impacts associated with shortened seasons...	June 2005	Del Norte County, CA	Recreational
Over the last several years most of the hook and line fishermen have gone out of business because restrictive regulations have made fishing in this manner economically unrealistic. …Since one of the mandates of the Magnuson Act is to preserve the economic stability of the industry, I urge you to formulate groundfish regulations which are realistic in providing me, and other fixed gear fishermen, with a meaningful opportunity to engage in our method of fishing.	June 2005	California	Commercial

2005: September			
When [ODFW] shut down bottom fishing it devastated the Oregon coast economy. Not only was the sport industry affected; restaurants, hotels, gas stations, public sector, police, firemen (because of the tax base) - we lost a lot of money on the Oregon coast because of this. It is heartwrenching, because there was people on the Oregon coast who... lost their families, who lost their businesses. There were businesses reported losing $1400 per week... that had a devastating affect on our tax bases... so, dealing with that was horrifying, when the general public was told that they were not allowed to go out and fish to provide food for their families... We shouldn't let the guessing game [of counting fish] [cause] economic damages to the community or destroy families.	September 2005	Toledo, OR	Recreational
…At least one week [of fishing] would have made sure they had… electricity, heating oil, stuff like to that to get them through the winter, pay their rent… their basic needs and their basic local taxes… it does have a tremedous effect all the way around.	September 2005	Toledo, OR	Recreational
2005: November			
Fort Bragg is one of the major DTL ports. Our concern has been with the increased fuel cost, it's considerably more beneficial to us to have higher daily and weekly limits on the sablefish… [With the lower limits and higher fuel costs,] it doesn't leave a lot of money left.	November 2005	Fort Bragg, CA	Commercial
[Re: black rockfish]. What happened in Oregon, just before Labor Day, all groundfishing was stopped. That had a tremendous economic impact on my community, but… it had a very large psychological impact on my community. It was kind of like a kick in the face...all these people from all over the country who had plans to come to the Oregon coast to go fishing, to spend their money, those plans were stopped with 72 hour notice [or less]... And then again this year, [black rockfish was closed in October]. This is not a very safe thing for some of these sports fishermen [who may be tempted to go further out into unsafe waters]... I'm here to beg the [Council] to explore ways of increasing the ABC/OY for black rockfish in Oregon and California. ...	November 2005	Garibaldi, OR	Processor
The PFMC management style over the last few years has been off and on again more than I can count. This tears families apart, making it impossible to hire, train, and keep good employees, not to mention maintaining boats, trucks, fishing gear, and montages [sic]. It also tears at the social fabric of coastal communities, ports, fuel docks, suppliers, banks, and restaurants and other support industries, and the employees and families of those businesses. ...	November 2005	Brookings-Harbor, OR	Commercial

The decision of NMFS last year to cut off groundfish days before Labor Day, the largest tourist day on our coastline, was devastating. Over $529,000 was lost to Garibaldi alone. This kind of timing decisions are truly uncalled for and are based on speculation at best. As a Port commissioner to Garibaldi, it is difficult to see the economic impact on an already struggling portal city. Council members demand the facts, review the economic impact - lives are at stake.	November 2005	Garibaldi, OR	Processor
[In regard to sport canary and black rockfish regulations] - Please consider the economic effects you impose on our communities before you make any more mistakes.	November 2005	Garibaldi, OR	Recreational
We are northwest fishermen that have been severely affected by your recent change in the bottomfishing quotas. You have hurt us financially, putting our boats (three) into dry dock because of the low quotas. Someone is not properly assessing the fish stocks which we have complained of on numerous occasions...several times we've offered our services to show you fellows the multiple fish schools out there with no response... we feel it's not financially [beneficial] to sit around all summer to catch our few...quotas you've allowed us. You've made us ready to quit and sell our boats than to keep our profession of [fishing].	November 2005	Garibaldi, OR	Commercial
In past years we've created laws to protect the fishing fleet and industry. The reality today is that it's now slowly eliminating the small fisherman… Fishing areas are not being regulated evenly. The scientific data is wrong.	November 2005	Garibaldi, OR	Processor
My wife and I have been hook and line fishing commercially for over the past 11 years, for black rockfish. We fish out of Garibaldi, Oregon. We do this primarily to supplement our social security.	November 2005	Garibaldi, OR	Commercial
2006: March			
I'd like to give support for the stepped-down approach concerning yelloweye rockfish… Buy adopting this approach, we can spare possibly complete closures off the Washington coast and Oregon [in the halibut, bottomfish and salmon recreational fisheries].... The Washington coast recreational halibut fishery…is [worth] at least $1.6 million…	March 2006	Westport, WA	Recreational
2006: April			
The 9th Circuit case reaffirms the Magnuson Act requirements to rebuild depleted species as quickly as possible… That language doesn't mean that the Council and NMFS should balance biological and economic needs; on the contrary, the decision reaffirms earlier ones in holding that… "the purpose of the act is clearly to give conservation of fish priority over short-term economic issues." …Without immediate efforts to rebuild, the long term survival of fishing communities is in doubt. The court also affirmed that Congress wanted to leave leeway to allow fishing on healthy stocks and avoid disastrous short term effects…	April 2006	[National organization]	Environmental
We realize it is critical to rebuild the overfished stocks; it	April	[Coastwide organization]	Processing

is also critical that we don't precipitate economic disaster. If the OYs are overly restrictive, the negative economic consequences could occur in the tens of millions of dollars. Many coastal communities are struggling now. An economic impact of this magnitude would create a depression in some areas. Lastly, the Council management teams and industry have crafted innovative and creative management tools in the last few years. Let us use those tools now to find solutions that avoid economic tragedy.	2006		
…If the [canary rockfish] OY was lowered to 44 metric tons, there's a very real possibility that the trawl survey could potentially shut down the shelf, severely impacting our coastal communities. … With the recreational and commercial salmon fishery all but gone this year, and the Dungeness crab landings tapering off, our coastal communities will be depending on groundfish more than ever... Curtailment of the groundfish fishery not only has a negative short term impact; there's a long-term effect as well... Ask any processor how it is to buy back into the market when farm-raised products and imports have taken the place of our products. These interruptions in product flow almost always result in lower exvessel prices to the fleet, and are detrimental to the entire coastal supply chain… With respect to the health of our coastal communities, I believe that while we are still alive, we are far from healthy. While the cuts each year have been necessary, they have been extremely onerous. Each year the fleet has left millions of dollars of healthy species in the water due to the constraints of overfished species…	April 2006	Oregon	Commercial
I think the rampdown is a very sensible way to … avoid unnecessary impacts on small businesses. In the north where yelloweye impacts are the greatest, most open access and recreational businesses are small businesses, and they are the ones that are going to be impacted … the most. They're more susceptible to quick economic downturns, due to smaller profit margins… and they have smaller reserves. … Due to past reductions, most small business fisheries have been at or near the tipping point—that's the point where you're not making enough profit to be able to justify your effort…and I think a rampdown might even be a way to allow some fishermen to plan their exit from the fishery… giving someone a few years to plan his exit is a way to keep him from just facing a disastrous event all at once… [Quoted from "Trends in Fishing and Seafood Processing-Related Establishments and Employment in West Coast Fishing Communities," pp. 11, 15; noted that the five most dependent communities were all on the northern California and Oregon coast.] This is the area which is going to be hit hardest. This is the area where ports and people are more dependent on rockcod than other fisheries… We don't have a lot of other industries besides our ports.	April 2006	Crescent City, CA	Commercial
The fishing community is basically on life support… As you make your decisions today, think about how the fishing community is being impacted. …Specifically, each	April 2006	South/Central California	Commercial

metric ton that you allow the nearshore minor south to take… that's a lot of money. Considering what's going on with the salmon… these folks, all of us, are basically on life support. You're talking about short term needs—we need these fish…			
We are continuing to work with state and federal agencies to quantify the socioeconomic impacts of changes to the groundfish fishery on our community. The use of 12-13 metric tons of yelloweye for 2007-2008 would put and end, pretty much, to the positive changes we're making, and we think a minor disruption in the time to rebuild caused by a phase-in is far preferable to the major economic disruption caused by a drastic cut. We need the flexibility in the phase-in to continue what we've been doing.	April 2006	Westport, WA	Recreational
If we do start out at 12.0 or 12.6 metric tons, instead of the phased in, stepped down approach, it will close our halibut fishery in the ocean, and that would be devastating, it would be a disaster. So we have to support the stepped down approach.	April 2006	Neah Bay, WA	Recreational
Even with or without a normal salmon season, we need our rockfish. If we reach the ABC/OY and have an early closure of any sort at all, we'll have economic effects that will be staggering to the CPFV fleet. Many, many businesses will close; families will be torn apart. In one month alone, October for example, if [it's] closed in the north central, it'll cost a minimum of $2 million in just lost fares alone on the CPFV boats. … Every pound of fish not accessible can be directly translated into lost dollars. Alternative 4 will not hurt the fishery or the resource, but it will help to support those who make their living in the nearshore [fishery], by helping to give us as long a season as possible to avoid economic disaster.	April 2006	Northern California	Recreational
… Adopt the highest OYs possible; anything less represents an economic hardship that really would be excruciating, so much so it would cause myself and others to be on the brink of, if not already have, filed bankruptcy, especially in light of the salmon situation… This is a burden that's going to be too big for a lot of us to bear, and we're all going to end up… facing losing a business and a livelihood that I have been in for virtually all of my life. I'm not young; for me to go do something else at this time of my life is getting to be pretty hard…	April 2006		Recreational
[To evaluate socioeconomic impacts, we need baselines for measuring these changes. Referred to Moss Landing harbor report by Dr. Carrie Pomeroy & Dr. Mike Dalton as a good example of baseline information.]	April 2006		Commercial
[Supports stepped down yelloweye plan]. At the 12 metric ton level, we determine that in the Oregon recreational [fishery] that the season would be so short that dramatic, catastrophic monetary losses would occur. ...I would hope that the economic numbers could move up on the priority list, because of some of these conditions that are actually not even the fault of fishermen.	April 2006	Oregon	Recreational

Other documents (scoping summaries from rebuilding plans and environmental impact statements)			
Consider effects of decisions on fishing community infrastructure (cumulative from all rebuilding plans)			Community
Consider socioeconomic impacts on coastal (not just fishing) communities.			Community
Create and distribute a document describing individual and cumulative effects on communities.			Community
Current limits will cause the demise of the California sportfish fishery and those who depend on it.		Newport Beach, CA	Recreational
Fishermen will have a hard time surviving unless quotas or fishing grounds increase; cannot operate business.			Commercial
Regulations are putting me out of business			Commercial
The market infrastructure seems about to collapse.			Community
With the current trip limits in the California sportfish fishery, people are not going fishing.		Newport Beach, CA	Recreational
If small trawl fishery in northern Washington cannot survive, will have negative impact on communities.		Neah Bay, WA	Commercial
Evaluate impacts on individual communities, not just fishery sectors.			Community
Small boats in northern Washington have suffered many setbacks already: can only fish nearshore; limited by weather; closures due to cable crossings, etc.		Neah Bay, WA	Commercial
Magnuson Act says that fisheries must be sustainable for fish AND fishermen; take this into account.		Neah Bay, WA	Community
Take into account small family-owned boats that fish in northern Washington state.		Neah Bay, WA	Commercial
The RCA isn't hurting communities as far as trawlers are concerned; the problem is that processors don't want to buy the types of fish that can be caught cleanly. Processor limits force fishermen to discard target species.			Commercial
Look at the sociocultural value of recreational fishery resources.			Recreational
Look at fish processing as part of the system and whether this system maintains the viability of processors.			Processing
The Council seems only to consider the economic value of processors.			Processing
Look more at social impacts of recreational fisheries management, including culture of recreational fishing and the relationship to tourism.			Recreational
Previous economic analyses have underestimated the economic costs of limiting catches in the January-February and November-February periods when Petrale sole catch is not limited by management measures.			Commercial

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

There are two suites of alternatives analyzed in this EIS. The first suite of alternatives is the range of 2007-2008 harvest specifications or acceptable biological catches (ABCs) and optimum yields (OYs) considered for groundfish stocks and stock complexes managed under the Groundfish FMP. The range of harvest specifications for depleted groundfish species is also analyzed to understand the potential conservation and socioeconomic consequences of alternative depleted species' rebuilding plans. Therefore, the Council's preferred 2007-2008 OY alternative serves two purposes: both as the harvest specifications for the years 2007 and 2008 and, for depleted species, as the next step in the longer term mortality schedules for rebuilding plans. The target rebuilding year for each depleted species under rebuilding is also set in this decision step as the most likely year to rebuild under the Council-preferred OY and mortality schedule. Harvest specification (and rebuilding plan) alternatives are described in section 2.1.

The second suite of alternatives analyzed in this EIS is alternative 2007-2008 management measures. Alternative management measures adopted for analysis are designed to illustrate the potential efficacy and tradeoffs of management strategies and allocations considered for the next biennial management period by the Council. The overarching objectives of 2007-2008 management measures are to stay within the Council-preferred annual OYs for groundfish stocks and stock complexes and to equitably allocate fishing opportunities and other fishery benefits across fishing sectors and regions under Council jurisdiction. Alternative 2007-2008 management measures are described in section 2.2.

2.1 Alternative Harvest Specifications

Table 2-1 depicts the alternative harvest specifications for groundfish stocks and stock complexes managed under the FMP and considered by the Council for the 2007-2008 management period. The Council decided to average projected 2007 and 2008 OYs from adopted assessments and rebuilding analyses with the intent to specify an average OY, which is applied to both years. In some cases, and only for stocks with quantitative assessments, the Council also decided to average projected ABCs for the 2007-2008 management period (see FMP §4.3.1). In cases where the OY might exceed an ABC in any one year, the OY is capped at that ABC since an ABC cannot legally be exceeded.

2.1.1 Depleted Groundfish Species

Depleted groundfish species are those with spawning biomasses that have dropped below the Council's depletion or overfished threshold of 25% of initial spawning biomass (or $B_{25\%}$). The Groundfish FMP mandates these stocks need to be rebuilt through harvest restrictions and other conservation measures to 40% of unfished biomass (or $B_{40\%}$). Furthermore, the MSA mandates these rebuilding periods need to be the shortest time possible while taking into account the status and biology of the depleted stock, the needs of fishing communities, and the interaction of the depleted stock within the marine ecosystem. This mandate was underscored in an August 2005 ruling by the Ninth Circuit Court of Appeals in a challenge to the Council's darkblotched rockfish rebuilding plan. In accordance with that ruling, the Council decided to reconsider all adopted rebuilding plans to ensure they comply with the MSA as interpreted by the courts. Therefore, the range of harvest specifications for depleted groundfish species under rebuilding and analyzed in this EIS has been expanded to more effectively analyze what it means to "rebuild in the shortest time possible, taking into account the needs of fishing communities" by considering the impacts of allowing some access to healthy fish stocks. Access to healthy fish stocks would mean some mortality of depleted species that are caught as bycatch in these fisheries would be allowed. Any harvest of depleted groundfish stocks is anticipated to be unavoidable bycatch. The Council-preferred harvest specifications for depleted species are the mortality limits for these species that the Council recommends under rebuilding to avoid disastrous short-term socioeconomic impacts to

West Coast fishing communities. Rebuilding periods for depleted species are coincident with the Council's recommendation for OYs for these species and defined in the Council's rebuilding framework, as specified in the Groundfish FMP, as the median time to attain the target spawning biomass of $B_{40\%}$ under a given harvest rate or mortality schedule.

Prior to the new groundfish assessments conducted, reviewed, and adopted in 2005 under Council procedures, the depleted groundfish species under rebuilding were bocaccio (in waters south of 40°10' N latitude), canary rockfish, cowcod, darkblotched rockfish, lingcod, Pacific ocean perch, widow rockfish, and yelloweye rockfish. However, the 2005 lingcod assessment {Jagielo 2006} indicates that the coastwide lingcod stock has attained (and exceeded) the $B_{40\%}$ spawning biomass threshold and is now considered successfully rebuilt. No new species were declared depleted from the 23 groundfish assessments conducted in 2005. Therefore, the Council is continuing rebuilding plans for the other seven species only and reconsidering those plans in response to a Ninth Circuit Court of Appeals ruling discussed above and in Chapter 1. To fully analyze both the conservation needs of each depleted stock and the socioeconomic effects of alternative rebuilding plans, a wide range of OYs have been specified for analysis for each depleted species (Table 2-2a). Each of these OY alternatives is based on the best available science as recommended by Stock Assessment Review (STAR) panels and the Council's Scientific and Statistical Committee (SSC). Section 2.1.1 describes the scientific basis for each depleted species' OY alternative and describes the strategic analyses of these alternatives that are presented in more detail in subsequent chapters of this EIS.

In considering potential rebuilding alternatives, first, the consequences of each depleted species' OY alternative was examined in isolation to understand the tradeoff between the amount of allowable harvest and alternative rebuilding periods and to identify the West Coast fisheries that are affected by the constraints posed by alternative rebuilding plans for each particular depleted species. The predicted rebuilding periods and the annual OYs that describe the alternative rebuilding schedules, each of which define a rebuilding plan, are estimated using the SSC's endorsed rebuilding program {Punt 2005}. The rebuilding program is a probabilistic population simulator that explores alternative harvest rates and predicts the total mortality and duration of rebuilding for each depleted species under a range of harvest rates. The depleted species' OY alternatives analyzed in this EIS, based on harvest rates estimated from the rebuilding simulation program, are calculated using an instantaneous rate of fishing mortality (F), which may be converted to a Spawning Potential Ratio. For ease of comparison among stocks and to standardize the basis of rebuilding calculations, it is useful to express any specific fishing mortality rate in terms of its effect on Spawning Potential Ratio (SPR = spawning per recruit at the current population level relative to that at the stock's unfished condition). Given fishery selectivity patterns and basic life history parameters, there is a direct inverse relationship between F and SPR (Figure 2-1). When there is no fishing, each new female recruit is expected to achieve 100% of its spawning potential. As fishing intensity increases, expected lifetime reproduction declines due to this added source of mortality. Conversion of F into the equivalent SPR has the benefit of standardizing for differences in growth, maturity, fecundity, natural mortality, and fishery selectivity patterns and, as a consequence, the Council's SSC recommends it be used routinely. The rebuilding program is more thoroughly described in Chapter 6. The OY alternatives for depleted species are described in section 2.1.1.1.

Table 2-1. Council-adopted alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2007 and 2008. (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative				2007 and 2008 Action Alternatives a/												
	2005 ABC	2005 OY	2006 ABC	2006 OY	Alt 1 2007 ABC	Alt 2 2007 ABC	Alt 1 2008 ABC	Alt 2 2008 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Council 2007 ABC b/	Council 2008 ABC b/	Council OY b/
Lingcod - coastwide c/	2,922	2,414	2,716	2,414	6,706		5,853		6,280	6,088					6,280	6,280	
Columbia and US-Vanc. areas		1,694		1,694					5,428	5,428							
Eureka, Monterey, and Conception areas		719		719					852	660							
N. of 42 (OR & WA)		1,801		1,801					5,558	5,558							5,558
S. of 42 (CA)		612		612					722	530							612
Pacific Cod	3,200	1,600	3,200	1,600	3,200		3,200		1,600						3,200	3,200	1,600
Pacific Whiting (U.S.)	269,545	269,069	488,850	269,069	244,425	733,275	244,425	733,275	134,534	403,604					To be determined in March 2007 and 2008		
Sablefish (Coastwide)	8,368	7,761	8,175	7,634	6,210		6,058		4,574	5,934					6,210	6,058	5,934 d/
N. of 36 (Monterey north)		7,486		7,363					4,411	5,723							
S. of 36 (Conception area)		275		271					162	210							
PACIFIC OCEAN PERCH	966	447	934	447	900		911		0	87	405	514	749		900	911	44 or 100
Shortbelly Rockfish	13,900	13,900	13,900	13,900	13,900		13,900		13,900						13,900	13,900	13,900
WIDOW ROCKFISH	3,218	285	3,059	289	5,334		5,144		0	329	456	917	1,369		5,334	5,144	120 or 368
CANARY ROCKFISH	270	47	279	47	172		179		0	24	44	68			172	179	32 or 44
Chilipepper Rockfish	2,700	2,000	2,700	2,000	2,700		2,700		2,000	2,700					2,700	2,700	2,000
BOCACCIO	566	307	549	309	602		618		0	149	218	315	424		602	618	40 or 218
Splitnose Rockfish	615	461	615	461	615		615		461						615	615	461
Yellowtail Rockfish	3,896	3,896	3,681	3,681	4,585		4,510		4,548						4,548	4,548	4,548
Shortspine Thornyhead - coastwide					2,488		2,463		1,661	2,476					2,476	2,476	e/
Shortspine Thornyhead - N. of 34deg27'	1,055	999	1,077	1,018					1,240	1,634							1,634
Shortspine Thornyhead - S. of 34deg27'									421	841							421
Longspine Thornyhead - coastwide	2,851	2,656	2,851	2,656	3,953		3,860		2,696	3,930					3,907	3,907	e/
Longspine Thornyhead - N. of 34deg27'		2,461		2,461					2,220	2,989							2,220
Longspine Thornyhead - S. of 34deg27'		195		195					476	941							476
COWCOD - S. of 36 (Conception area)	5	2.1	5	2.1	17		17		0	4	7	9	11		17	17	4 or 8 f/
COWCOD - Monterey area	19	2.1	19	2.1	19		19		0	4	7	9	11		19	19	
DARKBLOTCHED	269	269	294	200	456		487		0	130	229	330	472		456	487	130 or 229

Table 2-1. Council-adopted alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2007 and 2008 (continued). (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative				2007 and 2008 Action Alternatives a/												
	2005 ABC	2005 OY	2006 ABC	2006 OY	Alt 1 2007 ABC	Alt 2 2007 ABC	Alt 1 2008 ABC	Alt 2 2008 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Council 2007 ABC b/	Council 2008 ABC b/	Council OY b/
YELLOWEYE g/	54	26	55	27	26		26		0	12	~~17~~	~~21~~	~~24~~	~~27~~	26	26	12.6 or ramp-down h/
Nearshore Species																	
Black Rockfish (WA)	540	540	540	540	540		540		540						540	540	540
Black Rockfish (OR-CA)	753	753	736	736	725		719		722						722	722	722
Minor Rockfish North	3,680	2,250	3,680	2,250	3,680				2,250	2,270	2,290				3,680	3,680	2,270
Nearshore Species		122		122					122	142	162						142
Shelf Species		968		968			968		968	968	968						968
Slope Species		1,160		1,160			1,160		1,160	1,160	1,160						1,160
Remaining Rockfish North i/	1,612	1,216	1,612	1,216	1,612		1,612		1,216								
Bocaccio	318	239	318	239	318		318		239								
Chilipepper - Eureka	32	32	32	32	32		32		32								
Redstripe	576	432	576	432	576		576		432								
Sharpchin	307	230	307	230	307		307		230								
Silvergrey	38	29	38	29	38		38		29								
Splitnose	242	182	242	182	242		242		182								
Yellowmouth	99	74	99	74	99		99		74								
Other Rockfish North i/	2,068	1,034	2,068	1,034	2,068		2,068		1,034								
Minor Rockfish South	3,412	1,968	3,412	1,968	3,403		3,403		1,753	1,855	1,931	2,006			3,403	3,403	1,904
Nearshore Species		615		615					413	515	591	666					564
Shelf Species		714		714					714	714	714	714					714
Slope Species		639		639					626	626	626	626					626
Remaining Rockfish South i/	854	689	854	689	854		854		689								
Bank	350	263	350	263	350		350		263								
Blackgill	343	305	343	305	292		292		292								
Gopher	97	48.5	97	48.5	302		302		49	151	227	302					
Sharpchin	45	34	45	34	45		45		34								
Yellowtail	116	87	116	87	116		116		87								
Other Rockfish South i/	2,558	1,279	2,558	1,279	2,558		2,558		1,279								

Table 2-1. Council-adopted alternatives for acceptable biological catches (ABCs) and total catch optimum yields (OYs) (mt) for 2007 and 2008 (continued). (Overfished stocks in CAPS; Stocks with new assessments in bold).

Stock	No Action Alternative				2007 and 2008 Action Alternatives a/												
	2005 ABC	2005 OY	2006 ABC	2006 OY	Alt 1 2007 ABC	Alt 2 2007 ABC	Alt 1 2008 ABC	Alt 2 2008 ABC	Alt 1 OY	Alt 2 OY	Alt 3 OY	Alt 4 OY	Alt 5 OY	Alt 6 OY	Council 2007 ABC b/	Council 2008 ABC b/	Council OY b/
California scorpionfish	Not specified - managed as part of Minor RF South				137	219	137	219	137	219					219	219	175
Cabezon (off CA only)	103	69	108	69	94		94		69						94	94	69
Dover Sole	8,522	7,476	8,589	7,564	28,522		28,442		16,500	28,482					28,522	28,442	16,500
English Sole	3,100	3,100	3,100	3,100	6,773		5,701		6,237						6,237	6,237	6,237
Petrale Sole (coastwide) c/	2,762	2,762	2,762	2,762	2,917		2,919		1,921	2,499	2,883				2,917	2,919	2,499
Columbia and US-Vanc. areas									910	1,347	1,347						
Eureka, Monterey, and Conception areas									1,012	1,152	1,536						
N of 40deg10'									1,176	1,651	1,752						
S of 40deg10'									745	848	1,131						
Arrowtooth Flounder	5,800	5,800	5,800	5,800	5,800		5,800		5,800						5,800	5,800	5,800
Starry Flounder	Not specified - managed as part of Other Flatfish				1,221		1,395		890	1,186					1,221	1,221	890
Other Flatfish	6,781	4,909	6,781	4,909	6,731		6,731		4,884						6,731	6,731	4,884
Other Fish	14,600	7,300	14,600	7,300	14,600		14,600		7,300						14,600	14,600	7,300
Kelp Greenling HG (OR)									No Fed HG	fed HG = state HG							No Fed HG

a/ The Council elected to average OY projections for 2007 and 2008 and analyze/specify the average OYs for each year. ABCs, in some cases, are specified similarly for some species with quantitative assessments. Otherwise, ABCs are year-specific.

b/ Council ABC and Council OY represent the Council's preferred harvest alternative for 2007 and 2008.

c/ Area OYs/HGs are stratified according to the assessment areas and alternatively adjusted by management areas for lingcod and petrale sole.

d/ The Council specified a coastwide 2007-2008 sablefish OY (Alt. 2 OY). However, sector allocations are based on the portion of the OY north of 36 deg. N. lat.

e/ A coastwide OY was not adopted for longspine and shortspine thornyheads. Separate OYs north and south of Pt. Conception at 34deg.27' N. lat. were specified.

f/ The preferred OY is for the Conception and Monterey areas combined.

g/ The yelloweye OY alternatives originally specified for analysis in Nov. 2005 were based on the 2005 assessment. The revised 2006 assessment and rebuilding analysis, adopted in Mar. 2006, projects a range of allowable 2007-2008 OYs under a constant harvest rate strategy of <=15 mt. Therefore, alternatives 3-6 were eliminated from further analysis.

h/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.

i/ The Remaining Rockfish and Other Rockfish categories are shown to understand how the Minor Rockfish complex harvest specifications are derived. These are not management targets.

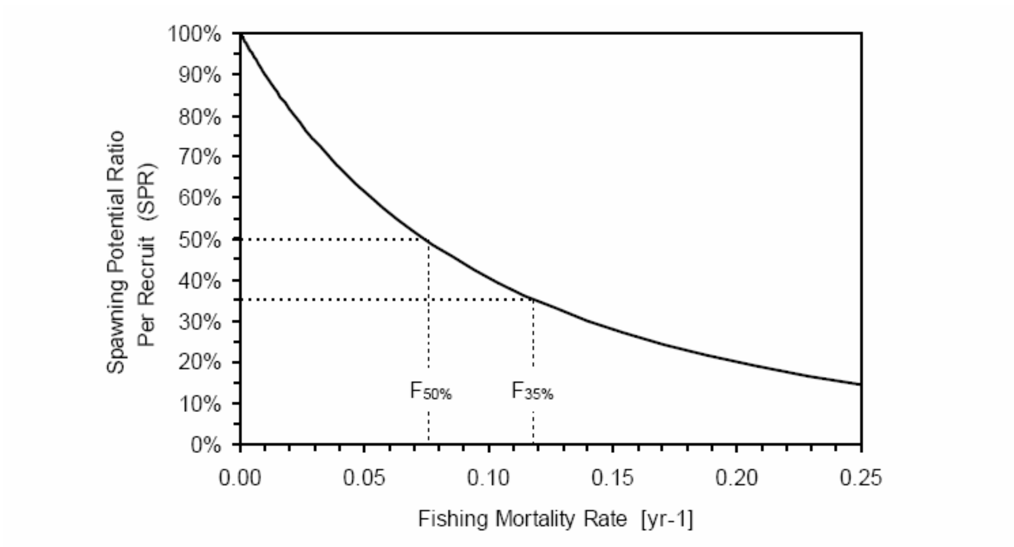

Figure 2-1. Relationship between spawning potential ratio (SPR) and instantaneous fishing mortality rate (F) for a hypothetical rockfish.

Next, rebuilding alternatives were developed by arranging the depleted species' OYs in various combinations (Table 2-2b) and then modeling changes to the current management regime to understand how rebuilding plans for different species interact to constrain fishing opportunities. The OYs in these rebuilding alternatives are strategically arrayed to illuminate how each species might differentially constrain fishing opportunities by sector (or gear type) and region along the West Coast, depending on the amount of allowable harvest of each species. It is important to note that the full range of OY alternatives described in Table 2-2a are not used to structure these rebuilding alternatives. Some of the higher OY alternatives in Table 2-2a are not used to structure the rebuilding alternatives in Table 2-2b. For example, the highest OY alternative for widow rockfish (OY Alternative 5) was not included among the rebuilding alternatives because it represents an amount of bycatch not observed in the current management regime. Prior to 2003, when there was a directed midwater trawl fishery for yellowtail and widow rockfish, catches of widow rockfish approached the level of mortality consistent with the OY Alternative 5 in Table 2-2a. However, the current understanding of the association of the more constraining canary rockfish stock with yellowtail rockfish leads to the conclusion that the available potential harvest of canary rockfish (as described by the range of OYs in Table 2-2a) would constrain any directed midwater trawl opportunities for yellowtail rockfish before the widow rockfish bycatch would approach the higher available OYs for that stock. Therefore, the rebuilding alternatives in Table 2-2b are structured using a narrower range of depleted species' OYs than those depicted in Table 2-2a. The rebuilding alternatives are described in detail below, in Section 2.1.1.2.

At their April 2006 meeting, the Council selected a preferred OY alternative for all managed groundfish species and species complexes except for the seven depleted species (Table 2-1). For the depleted species, the Council selected two preferred OY alternatives for further analysis for each stock. A final preferred OY and rebuilding plan for each depleted species will be decided at the June 2006 Council meeting. As discussed above, the Council's preferred OY alternative for the 2007-2008 fisheries must be consistent with any intent to modify depleted species rebuilding plans. Therefore, the choice of a preferred OY alternative involves consideration of both short-term effects (during 2007-2008) and long-term effects (the future application of rebuilding plans as revised by Amendment 16-4).

2.1.1.1 Optimum Yield Alternatives for Depleted Species

Table 2.2a depicts the range of depleted species' OY alternatives specified for analysis by the Council in November 2005 and April 2006. The numbered OY alternatives in Table 2-2a correspond to the alternative harvest levels that the Council originally selected for analysis in November 2005. In April 2006, the Council decided that the Preferred Low OY and High OY alternatives would represent the range of OYs that should be the focus of more detailed analysis. These preferred OY alternatives will be the range the Council will select from in June 2006 when final depleted species' OYs and rebuilding plans will be adopted. Table 2-3 and Figure 2-2 indicate the median time to rebuild under each 2007-2008 OY alternative.

Table 2-2a. Range of 2007-2008 OYs for depleted groundfish species decided at the November 2005 and April 2006 Council meetings.

		2007-2008 OYs (mt)							
Stock	**Association**	**OY Alt. 1**	**OY Alt. 2**	**OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**	**OY Alt. 6**	**Pref. Low OY Alt.**	**Pref. High OY Alt.**
Yelloweye a/	Northern	0	12	~~17~~	~~21~~	~~24~~	~~27~~	12.6	Ramp-down b/
Canary	Shelf	0	24	44	68			32	44
Cowcod c/	Southern	0	8	14	18	22		4	8
Bocaccio	Shelf	0	149	218	315	424		40	218
Darkblotched	Northern	0	130	229	330	472		130	229
POP	Slope	0	87	405	514	749		44	100
Widow	Midwater	0	329	456	917	1,369		120	368

a/ A 2007-2008 OY >= 15 mt for yelloweye would result in a less than a 50% probability of rebuilding before Tmax, which is not legally viable. OY Alternatives 3-6 are discussed further in section 2.1.5 of the EIS.

b/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.

c/ OY alternatives for Conception and Monterey areas combined.

Table 2-2b. Amendment 16-4 rebuilding alternatives.

		2007-2008 OYs (mt)					
Stock	**Association**	**"Status Quo" Reb. Alt. a/**	**Reb. Alt. 1**	**Reb. Alt. 2**	**Reb. Alt. 3**	**Reb. Alt. 4**	**Reb. Alt. 5**
Yelloweye	Northern	27	21	17	21	12	12
Canary	Shelf	44	24	44	68	24	24
Cowcod b/	Southern	5	8	18	22	14	3
Bocaccio	Shelf	149	149	218	424	315	40
Darkblotched	Northern	229	330	229	472	472	130
POP	Slope	87	405	87	749	405	44
Widow	Midwater	329	456	329	917	329	120

a/ The species' OYs described in the "status quo" rebuilding alternative are determined by calculating the effective SPR harvest rate from the November 2005 bycatch scorecard and projecting this harvest rate forward to 2007.

b/ OY alternatives for Conception and Monterey areas combined.

Table 2-3. Estimated time to rebuild relative to the alternative 2007-2008 OYs for depleted West Coast groundfish species.

Species	Year Stock Declared Overfished	Ttarget in the FMP (Status Quo)	OY Alt. a/	Median Time to Rebuild	2007-08 OY (mt)	SPR Harvest Rate	2007-08 ABC (mt)	Tmin	Tmax	T (F=0)
Bocaccio	1999	2023	1	2021.1	0	100%	602	2018	2032	2021
(S of 40deg10')			Pref. Low OY	2021.9	40	92.8%				
				2024	106	88.3%				
			2	2024	149	84.4%				
			Pref. High OY (3)	2026	218	77.7%				
			4	2029	315	69.2%				
			5	2032	424					
				2050	602					
Canary	2000	2074	1	2053	0	100%	172	2048	2071	2053
			2	2058	24	93.5%				
			Pref. Low OY	2060	32	91.6%				
			Pref. High OY (3)	2063	44	88.7%				
			4	2071	68	83.1%				
Cowcod	2000	2090	1	2035	0	100%	26	2035	2074	2035
(Concep.+ Monterey areas)			Pref. Low OY	2039	4	90.0%				
				2040	4.6	90.0%				
			Pref. High OY (2)	2043	8	85.0%				
			3	2052	14	75.0%				
			4	2062	18	69.0%				
			5	2074	22	63.0%				
Darkblotched b/	2000	2030	1	2009.5	0	100%	456	2009	2033	2009.5
			Pref. Low OY (2)	2009.9	130	100%				
			Pref. High OY (3)	2010.2	229	100%				
			4	2010.5	330	100%				
			5	2012	472	50.0%				
				~~2014~~	~~521~~	~~46.1%~~				
				~~2016~~	~~581~~	~~42.9%~~				
				~~2033~~	~~696~~	~~37.6%~~				

Table 2-3. Estimated time to rebuild relative to the alternative 2007-2008 OYs for depleted West Coast groundfish species (continued).

Species	Year Stock Declared Overfished	Ttarget in the FMP (Status Quo)	OY Alt. a/	Median Time to Rebuild	2007-08 OY (mt)	SPR Harvest Rate	2007-08 ABC (mt)	Tmin	Tmax	T (F=0)
POP	1999	2026	1	2014.6	0	100%	900	2015	2043	2014.6
			Pref. Low OY	2015	44	95.5%				
			2	2015	87	92.0%				
			Pref. High OY	2015.6	100	90.5%				
			3	2021	405	69.6%				
			4	2025	514	64.4%				
			5	2048	749	54.4%				
Widow	2001	2038	1	2013	0	100%	5,334	2013	2033	2013
			Pref. Low OY	2014	120	97.3%				
			2	2015	329	96.0%				
			Pref. High OY	2015	368	95.0%				
			3	2016	456	93.6%				
			4	2020	917	88.6%				
			5	2027	1,369	83.4%				
Yelloweye c/	2002	2058	1	2048	0	100%	26	2046	2096	2048
			2	2078	12	73.8%				
			Pref. Low OY	2083	12.6	71.9%				
			Pref. High OY	2083.5	Ramp Down d/	NA				
			~~3~~	~~2097~~	~~17~~					
			~~4~~	~~2068~~	~~21~~					
			~~5~~	~~2080~~	~~24~~					
			~~6~~	~~2099~~	~~27~~					

a/ The numbered OY alternatives were specified for analysis by the Council in Nov. 2005. The Preferred OY alternatives were specified for analysis by the Council in April 2006.

b/ Darkblotched OY alternatives cannot exceed the ABC (456 mt in 2007 and 486 mt in 2008). Therefore, OY Alt. 5 can only be considered in 2008.

c/ A 2007-2008 OY >= 15 mt for yelloweye would result in a less than a 50% probability of rebuilding before Tmax, which is not legally viable. Alternatives 3-6 are discussed further in section 2.1.5 of the EIS.

d/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.

Bocaccio (in Waters off California South of 40°10' N Latitude)

The OY alternatives specified for analysis for the bocaccio stock south of 40°10' N latitude are 0 mt, 40 mt, 149 mt, 218 mt, 315 mt, and 424 mt (Tables 2-1 and 2-2a). This compares to the status quo OYs of 307 mt in 2005 and 309 mt in 2006.

The zero harvest alternative would rebuild the stock by 2021, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

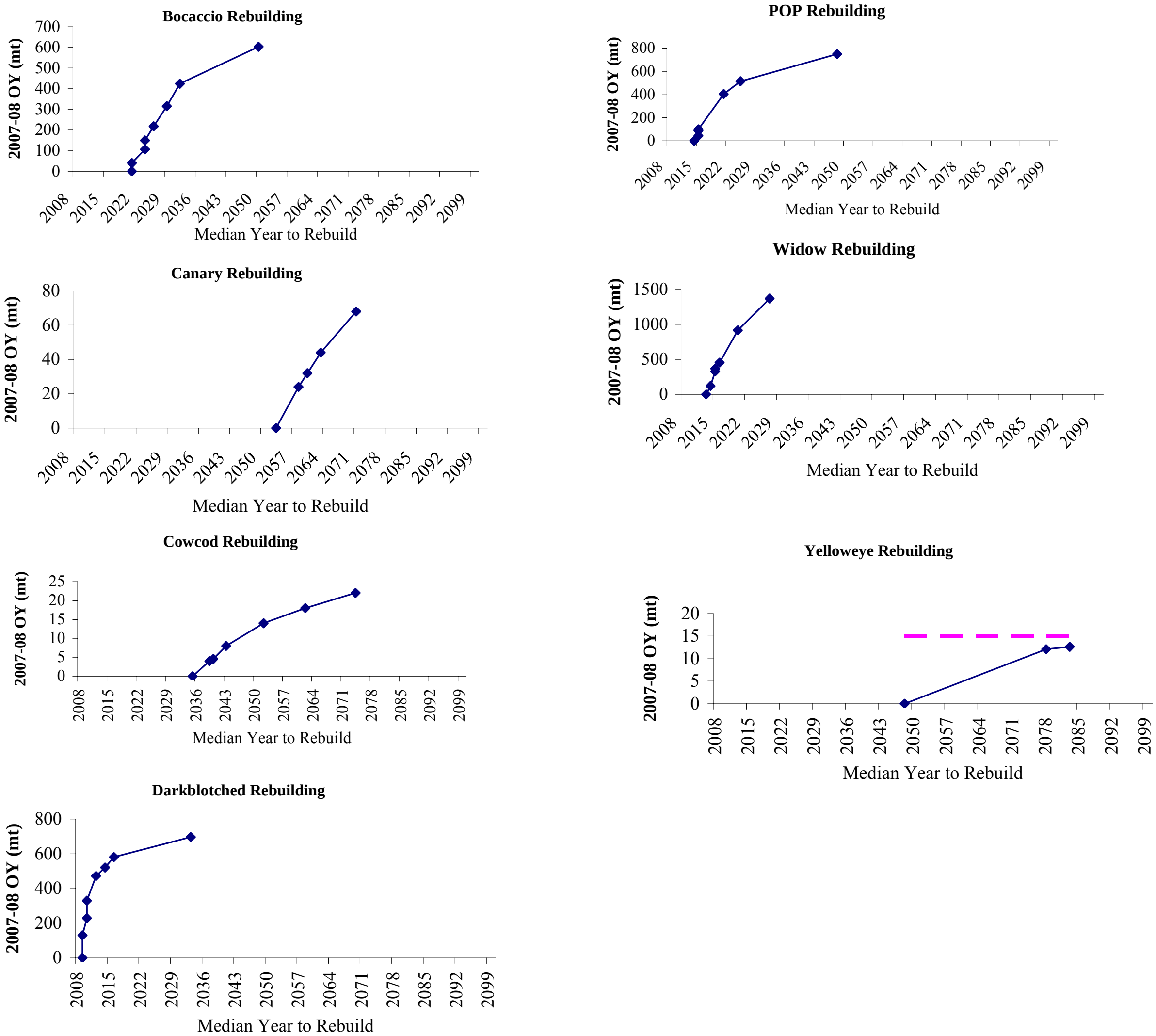

Figure 2-2. Predicted rebuilding duration vs. allowable 2007-2008 harvests for seven depleted West Coast groundfish species.

The 40 mt alternative is the Council's **Preferred Low OY Alternative** specified by the Council in April 2006. The median time to rebuild the stock under this alternative is 2021.9, or about 10 months longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 149 mt alternative is based on the effective harvest rate in 2005 projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying the best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting rate to the projected exploitable biomass in 2007 and 2008 {MacCall 2006a} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2024, or 3 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 218 mt OY alternative is the Council's **Preferred High OY Alternative** and represents the OY under an 80% rebuilding probability (P_{MAX} or the probability of successfully rebuilding the stock in the maximum allowable time under the current National Standard 1 Guidelines) from the 2003 rebuilding analysis {MacCall 2003b}. The median time to rebuild the stock under this alternative would be 2026, or 5 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 315 mt OY alternative represents the current SPR harvest rate of 69.2% applied to the 2007 and 2008 projections of exploitable biomass. This is the harvest rate used to establish the status quo 2005 and 2006 OYs. The median time to rebuild the stock under this alternative would be 2029, or 8 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 424 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {MacCall 2006}. This is the highest OY that can be considered for bocaccio in that it is based on the best available science and is at the 50% rebuilding probability threshold established in litigation (*Natural Resources Defense Council v. Daley*, April 25, 2000, U.S. Court of Appeals for the District of Columbia Circuit). The median time to rebuild the stock under this alternative would be 2032, or 11 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Canary Rockfish

The OY alternatives specified for analysis for the coastwide canary rockfish stock are 0 mt, 24 mt, 32 mt, 44 mt, and 68 mt (Tables 2-1 and 2-2a). This compares to the status quo OY of 47 mt in 2005 and 2006.

The zero harvest alternative would rebuild the stock by 2053, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 24 mt OY alternative represents the OY under a 60% rebuilding probability (the status quo P_{MAX}) from the new rebuilding analysis {Methot 2006}. The median time to rebuild the stock under this alternative would be 2058, or 5 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 32 mt alternative is the Council's **Preferred Low OY Alternative**. The median time to rebuild the stock under this alternative is 2060, or 7 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 44 mt OY alternative is the Council's **Preferred High OY Alternative** and applies the current SPR harvest rate of 88.7% to the 2007 and 2008 projections of exploitable biomass. This is the harvest rate used to establish the status quo 2005 and 2006 OYs. The median time to rebuild the stock under this alternative would be 2063, or 10 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 68 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {Methot 2006}. This is the highest OY that can be considered for canary rockfish in that it is based on the best available science and is at the 50% rebuilding probability threshold. The median time to rebuild the stock under this alternative would be 2071, or 18 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Cowcod

The OY alternatives specified for analysis for the cowcod stock occurring in the Conception and Monterey INPFC areas are 0 mt, 8 mt, 14 mt, 18 mt, and 22 mt (Tables 2-1 and 2-2a). This compares to the status quo OY of 4.2 mt in 2005 and 2006.

The zero harvest alternative would rebuild the stock by 2035, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 4 mt alternative is the Council's **Preferred Low OY Alternative** specified by the Council in April 2006. The median time to rebuild the stock under this alternative is 2039, or 4 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 8 mt OY alternative is the Council's **Preferred High OY Alternative** and represents the OY under a re-estimated 80% rebuilding probability from the new rebuilding analysis {Piner 2006}. The median time to rebuild the stock under this alternative would be 2043, or 8 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 14 mt OY alternative represents the OY under a re-estimated 70% rebuilding probability from the new rebuilding analysis {Piner 2006}. The median time to rebuild the stock under this alternative would be 2052, or 17 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 18 mt OY alternative represents the OY under a re-estimated 60% rebuilding probability (the status quo P_{MAX}) from the new rebuilding analysis {Piner 2006}. The median time to rebuild the stock under this alternative would be 2062, or 27 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 22 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {Piner 2006}. This is the highest OY that can be considered for canary rockfish in that it is based on the best available science and is at the 50% rebuilding probability threshold. The median time to rebuild the stock under this alternative would be 2074, or 39 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Darkblotched Rockfish

The OY alternatives specified for analysis for the coastwide darkblotched rockfish stock are 0 mt, 130 mt, 229 mt, 330 mt, and 424 mt (Tables 2-1 and 2-2a). This compares to the status quo OYs of 269 mt in 2005 and 200 mt in 2006.

The zero harvest alternative would rebuild the stock by 2009.5, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 130 mt OY alternative is the Council's **Preferred Low OY Alternative** and represents the OY specified in 2001. The Ninth Circuit court ruling compelling the Council and NMFS to consider Amendment 16-4 disputed the 2002 darkblotched harvest specification, which had changed this 2001 OY to a higher value. The median time to rebuild the stock under this alternative would be 2009.9, or approximately 5 months longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 229 mt OY alternative is the Council's **Preferred High OY Alternative** and is based on the effective harvest rate in 2005 (F = 0.0216) projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying its best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting harvest rate to the projected exploitable biomass in 2007 and 2008 {Rogers 2006a} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2010.2, or approximately 8 months longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 330 mt OY alternative applies the harvest rate used to set the 2005 OY (F = 0.032) to the 2007 and 2008 projections of exploitable biomass (OYs averaged and applied to each year). The median time to rebuild the stock under this alternative would be 2010.5, or 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 472 mt OY alternative represents the OY capped at the average 2007-2008 ABC specification. This is the highest OY that can be considered for darkblotched rockfish in that the ABC cannot be legally exceeded. The re-estimated P_{MAX} under this alternative is 97%. The median time to rebuild the stock under this alternative would be 2012, or 2.5 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Pacific Ocean Perch

The OY alternatives specified for analysis for the coastwide Pacific ocean perch (POP) stock are 0 mt, 44 mt, 87 mt, 100 mt, 405 mt, 514 mt, and 749 mt (Tables 2-1 and 2-2a). This compares to the status quo OY of 447 mt in 2005 and 2006.

The zero harvest alternative would rebuild the stock by 2014.6, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 44 mt alternative is the Council's **Preferred Low OY Alternative** specified by the Council in April 2006. The median time to rebuild the stock under this alternative is 2015, or about half a year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 87 mt OY alternative is based on the effective harvest rate in 2005 projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying its best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting harvest rate to the projected exploitable biomass in 2007 and 2008 {Hamel 2006b} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2015.4, or about 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 100 mt OY alternative is the Council's **Preferred High OY Alternative**. The median time to rebuild the stock under this alternative would be 2015.6, or 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 405 mt OY alternative represents the OY under a re-estimated 80% rebuilding probability from the new rebuilding analysis {Hamel 2006b}. The estimated SPR harvest rate under this alternative is 69.6%. The median time to rebuild the stock under this alternative would be 2021, or approximately 7 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 514 mt OY alternative represents the OY under a re-estimated 70% rebuilding probability (the status quo P_{MAX}) from the new rebuilding analysis {Hamel 2006b}. The median time to rebuild the stock under this alternative would be 2025, or 11 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 749 mt OY alternative represents the OY under a re-estimated P_{MAX} of 50% from the new rebuilding analysis {Hamel 2006b}. This is the highest OY that can be considered for POP in that it is based on the best available science and is at the 50% rebuilding probability threshold. The median time to rebuild the stock under this alternative would be 2048, or 34 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Widow Rockfish

The OY alternatives specified for analysis for the coastwide widow rockfish stock are 0 mt, 120 mt, 329 mt, 368 mt, 456 mt, 917 mt, and 1,369 mt (Tables 2-1 and 2-2a). This compares to the status quo OYs of 285 mt in 2005 and 289 mt in 2006.

The zero harvest alternative would rebuild the stock by 2013, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 120 mt alternative is the Council's **Preferred Low OY Alternative** and is predicted to rebuild the stock by 2014, which is 1 year longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 329 mt OY alternative is based on the effective harvest rate in 2005 projected forward to 2007 and 2008. The GMT determined the effective harvest rate by applying its best estimate of total mortality in 2005 divided by the exploitable biomass in 2005. The GMT then applied the resulting harvest rate to the projected exploitable biomass in 2007 and 2008 {He et al. 2006b} to determine projected OYs, which were then averaged for those years. The median time to rebuild the stock under this alternative would be 2015, or 2 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 368 mt alternative is the Council's **Preferred High OY Alternative** and is predicted to rebuild the stock by 2015, which is 2 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 456 mt OY alternative applies the current SPR harvest rate of 93.6% to the 2007 and 2008 projections of exploitable biomass. This is the harvest rate used to establish the status quo 2005 and 2006 OYs. The median time to rebuild the stock under this alternative would be 2016, or approximately 3 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 917 mt OY alternative represents the OY under a re-estimated 80% rebuilding probability from the new rebuilding analysis {He et al. 2006b}. The SPR harvest rate under this alternative is estimated to be 88.6%. The median time to rebuild the stock under this alternative would be 2020, or 7 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 1,369 mt OY alternative represents the OY under a re-estimated P_{MAX} of 60% from the new rebuilding analysis {He et al. 2006b}. The median time to rebuild the stock under this alternative would be 2027, or 14 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

Yelloweye Rockfish

The OY alternatives originally specified for analysis for the coastwide yelloweye rockfish stock were 0 mt, 12 mt, 17 mt, 21 mt, 24 mt, and 27 mt (Tables 2-1 and 2-2a). The first five yelloweye OY alternatives were derived from the 2005 yelloweye assessment and rebuilding analysis. However, in November 2005 the Council requested a new yelloweye assessment be done over the winter when numerous assessment data issues became known. The Council also specified the status quo 27 mt OY alternative for analysis in case a new, more optimistic assessment and rebuilding analysis were approved in 2006.

A new yelloweye stock assessment {Wallace et al. 2006} and rebuilding analysis {Tsou and Wallace 2006} were approved in March 2006. The new 2006 assessment was more pessimistic than the 2005 assessment and one implication of the new rebuilding analysis was that the projected range of allowable 2007-2008 OYs under a constant harvest rate strategy is ≤ 15 mt. That is, higher OYs would result in rebuilding probabilities ≤ 50%, which is not legally viable. Therefore, yelloweye OY Alternatives 3-6 in Table 2-2a were eliminated from further detailed study (see section 2.1.5).

The Council adopted for analysis a new OY alternative of 12.6 mt for 2007-2008 and consideration of a yelloweye harvest rate ramp-down strategy, which is explained in more detail below. Therefore, the full range of viable yelloweye OY alternatives analyzed for 2007-2008 and Amendment 16-4 are 0 mt, 12 mt, 12.6 mt, and the harvest rate ramp-down strategy, which specifies OYs of 23 mt and 20 mt for 2007 and 2008, respectively. This compares to the status quo OYs of 26 mt in 2005 and 27 mt in 2006.

The zero harvest alternative would rebuild the stock by 2048, which is the shortest possible time to rebuild ($T_{F=0}$) given our current understanding of stock productivity.

The 12 mt OY alternative would rebuild the stock by 2078, or 30 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The 12.6 mt alternative is the Council's **Preferred Low OY Alternative** and is based on a re-estimated 80% rebuilding probability from the new rebuilding analysis {Tsou and Wallace 2006}. This is the rebuilding probability from the status quo rebuilding plan and the SPR harvest rate under this alternative is estimated to be 71.9%. The median time to rebuild the stock under this alternative would be 2083, or 35 years longer than $T_{F=0}$ (Table 2-3 and Figure 2-2).

The yelloweye harvest rate ramp-down strategy is the Council's **Preferred High OY Alternative** and is designed to provide the Council time to develop management strategies to reduce current yelloweye impacts by more than 50%. The ramp-down strategy would sequentially lower the yelloweye harvest rate in the next four years before resuming a constant harvest rate rebuilding strategy in 2011. The OYs would be 23 mt, 20 mt, 17 mt, and 14 mt in 2007-2010. Under this strategy, the constant harvest rate would be the same as for the Preferred Low OY Alternative (SPR harvest rate = 71.9%) beginning in 2011. The median time to rebuild the stock under this alternative would be 2083.5, or 35.5 years longer than $T_{F=0}$ and about a half a year longer than the Preferred Low OY Alternative (Table 2-3 and Figure 2-2).

2.1.1.2 Rebuilding Alternatives

There are six rebuilding alternatives analyzed in this EIS (Table 2-2b). Each alternative was strategically developed to better compare and contrast the tradeoffs associated with alternative rebuilding strategies. These alternatives are analyzed by predicting the effect on the status quo management regime. Multiple suboptions are presented for each alternative to explore potential effects under different allocation scenarios.

The "status quo" rebuilding alternative is comprised of OY alternatives based on the effective harvest rates for each of the depleted stocks in 2005 projected forward to 2007 and 2008. The effective harvest rates were determined by applying the GMT's best estimate of total mortality in 2005 divided by the exploitable biomass of each stock in 2005. These harvest rates were then applied to the projected best exploitable biomasses in 2007 and 2008 to determine projected OYs.

Rebuilding alternative 1 would result in an increase in slope and midwater trawl fishing opportunities with the higher darkblotched, POP, and widow OYs; and a corresponding decrease in shelf fishing opportunities with the lower OYs for bocaccio, canary, cowcod, and yelloweye.

Rebuilding alternative 2 would result in higher southern shelf fishing opportunities with the higher bocaccio and cowcod OYs; lower northern recreational and limited entry and open access fixed gear opportunities with the lower yelloweye OY; and close to status quo for northern bottom and midwater trawl fishing opportunities with the "status quo" OYs for darkblotched, POP, and widow.

Rebuilding alternative 3 would result in higher shelf fish opportunities north and south with the higher bocaccio, cowcod, canary, and yelloweye OYs; and higher slope and midwater trawl fishing opportunities with the higher OYs for darkblotched, POP, and widow.

Rebuilding alternative 4 would dramatically lower northern shelf opportunities and some additional constraints in southern shelf fisheries north of Point Conception with the lower canary and yelloweye OYs; higher shelf fishing opportunities south of Pt. Conception with the higher bocaccio and cowcod OYs; and higher slope and midwater trawl opportunities with the higher darkblotched, POP, and widow OYs.

Rebuilding alternative 5 would dramatically lower shelf fishing opportunities coastwide with the lower bocaccio, cowcod, canary, and yelloweye OYs; and dramatically lower slope and midwater trawl fishing opportunities with the lower darkblotched, POP, and widow OYs.

2.1.2 Precautionary Zone Groundfish Species

Cabezon (in Waters off California)

The Council has identified one OY alternative, 69 mt, to be analyzed for the cabezon stock in waters off California (Table 2-1) for 2007 and 2008. This is the same as the status quo OY alternative. The ABC alternative identified for analysis is 94 mt for both 2007 and 2008; this alternative is based on the sum of average 2007-2008 ABCs for the northern and southern substocks (north and south of Pt. Conception), as determined in the 2005 stock assessment.

Pacific Whiting

Pacific whiting are managed based on an annual assessment prepared jointly by U.S. and Canadian scientists. Pacific whiting harvest specifications are based on annual assessments and are only analyzed in this EIS to understand the potential bycatch implications of future whiting fisheries. The 2007 ABC and OY will be adopted by the Council at its March 2007 meeting. As placeholders, the Council specified a range of coastwide ABC and OY alternatives for analysis as follows: an OY range of 134,534 mt to 403,604 mt (Table 2-1). This compares to the status quo U.S. OY of 269,069 mt for 2006. The range of 2007 and 2008 ABC alternatives specified for analysis are 244,425 mt to 733,275 mt. The status quo 2006 ABC is 488,850 mt.

Petrale Sole

Three 2007-2008 OY alternatives for petrale sole (coastwide) have been analyzed for Council decision: 1,921 mt, 2,499 mt, and 2,883 mt (Table 2-1). This compares to the status quo OY of 2,762 mt in 2005 and 2006. The OYs are also subdivided by INPFC regions (Columbia and US-Vancouver areas and Eureka, Monterey, and Conception areas) and by latitude (north and south of 40°10' N latitude).

The OY alternatives for the Columbia and US-Vancouver areas were identified by applying the following rationale: OY Alternative 1 is based on the low spawning biomass model from the 2005 stock assessment {Lai et al. 2005}; OY Alternatives 2 and 3 are the same, and are the result of a reduction from the ABC using the 40-10 rule. The ABC alternatives identified for analysis are 2,917 mt for 2007 and 2,919 mt for 2008. Using results from the 2005 stock assessment, each ABC was calculated by summing the north ABC and the south ABC/OY.

Sablefish

The Council identified the following alternatives to be analyzed for the coastwide sablefish stock (Table 2-1): 4,574 mt and 5,934 mt. This compares to the status quo OY of 7,761 mt in 2005 and 7,634 mt in 2006. 2007 and 2008 ABCs identified for analysis are 6,210 mt and 6,058 mt, respectively. OY Alternative 1 is calculated by applying the 40-10 adjustment to the ABC derived from the low stock/production model in the 2005 sablefish assessment {Schirripa and Colbert 2005}; OY Alternative 2 is calculated by applying the 40-10 adjustment using the assessment's base case model.

Each coastwide OY alternative is also divided north and south of 36^{o} N latitude using status quo proportions. Alternative methods for apportioning the OY were not considered because the STAR Panel {Barnes et al. 2005} recommended calculating coastwide biomass without including Conception area survey data.

2.1.3 Healthy Groundfish Species

Arrowtooth Flounder

As arrowtooth flounder is a healthy stock, the Council has identified a single ABC/OY alternative, 5,800 mt, to be analyzed (Table 2-1). This is the same as the status quo ABC/OY for 2005 and 2006; the stock has not been assessed since the previous harvest specifications process, and therefore there is no basis for identifying a value other than that of the status quo.

Black Rockfish (in Waters off Oregon and California)

The Council has specified one OY alternative for analysis for the black rockfish stock in waters off Oregon and California, 722 mt (Table 2-1), based on a projection from the base model in the 2003 assessment {Ralston 2003}. These projected ABCs (725 mt in 2007 and 719 mt in 2008) were averaged and specified for each year (722 mt). Since this is a healthy stock with a spawning biomass above $B_{40\%}$, the OYs were set equal to the ABC. This compares to the status quo OYs of 753 mt in 2005 and 736 mt in 2006, both of which had been set equal to the ABC for that year. Management of the southern black rockfish stock is divided at the California/Oregon border.

Black Rockfish (in Waters off Washington)

The northern black rockfish stock in waters off Washington is healthy. Therefore, the Council has identified a single ABC/OY alternative, 540 mt, to be analyzed (Table 2-1). This is the same as the status quo ABC/OY for 2005 and 2006 since the stock has not been assessed since the previous harvest specifications process; therefore, there is no basis for selecting a value other than the status quo. This value is based on 88% of the northern ABC for the assessed stock north of Cape Falcon, Oregon.

California Scorpionfish

California scorpionfish was first assessed in 2005 {Maunder et al. 2006}, and therefore 2007 will be the first year in which it is not managed as part of the Minor Nearshore Rockfish South complex and the first time that the Council adopts an ABC and an OY for the stock. The Council has specified two ABC/OY alternatives for analysis: 137 mt and 219 mt (Table 2-1). The first alternative, 137 mt, was derived using the recreational portion from the ABC/OY (based on the 2007-2008 average), multiplying it by 53%, dividing it by 88%, and then adding this modified value to the commercial portion of the ABC/OY (based on the 2007-2008 average). The second alternative provides an ABC/OY of 219 mt based on an average of the 2007 and 2008 ABC/OYs from the stock assessment {Maunder et al. 2005}.

The GMT recommends OY Alternative 1 (137 mt) a modified ABC/OY. This approach utilizes the full recreational data in determining the OY and allows California to track catches inseason with the CRFS program. By incorporating the ability to make inseason adjustments, the risk of either not achieving or overshooting the OY is reduced. The GMT refers the Council to "CDFG Draft Report on Background Information for Selection of 2007/2008 OYs for Gopher Rockfish, California Scorpionfish and Minor Nearshore Rockfish" for further explanation of the calculation of this OY Alternative.

Chilipepper Rockfish

The Council has specified status quo alternatives for chilipepper rockfish for 2007 and 2008 ABCs and OYs, as there is no new stock assessment from which to base new harvest specifications. These alternatives are an ABC of 2,700 mt and an OY of 2,000 mt for 2007-2008 (Table 2-1). The lower OY alternative is a precautionary specification to control the bycatch of bocaccio. The higher OY alternative equals the status quo ABC, since the stock is considered healthy. The rationale for considering this alternative is depth-based management may be an adequate bocaccio bycatch control mechanism.

Chilipepper rockfish within the Eureka INPFC region are managed within the Minor Rockfish North category, and therefore are not included within the ABC and OY alternative values.

Dover Sole

The OY alternatives specified for analysis for Dover sole stock are 16,500 mt and 28,482 mt (Table 2-1). This compares to the status quo OYs of 7,476 mt in 2005 and 7,564 mt in 2007. The first OY alternative is equal to the equilibrium MSY from the 2005 stock assessment {Sampson 2005}; the second alternative is set to the ABC alternative. The Council identified an ABC alternative of 28,522 mt for 2007 and 28,442 mt for 2008. These ABCs were calculated using the $F_{40\%}$ proxy harvest rate and represent the combined total of the south and the north portions of the stock.

English Sole

The OY alternative specified for analysis for English sole stock is 6,237 mt (Table 2-1). This compares to the status quo OY of 3,100 mt for 2005 and 2006. The Council identified an ABC alternative of 6,773 mt for 2007 and 5,701 mt for 2008. The OY alternative was determined by averaging of the 2007 and 2008 ABC alternatives. Projections from the 2005 stock assessment of English sole {Stewart 2005} were used to identify the ABC alternatives.

Lingcod

The OY alternatives specified for analysis for lingcod are 6,280 mt and 6,088 mt (Table 2-1). This compares to the status quo OY of 2,414 mt for 2005 and 2006; these 2005-2006 specifications were adopted by the Council with the lingcod rebuilding plan prior to the stock being declared rebuilt from its overfished status in November 2005. The first alternative was calculated by setting the OY equal to the coastwide ABC, as lingcod is a healthy stock. The second alternative is the sum of LCN and LCS (northern and southern lingcod substocks) OYs; the LCS OY was derived using a 40-10 adjustment.

The OYs are also subdivided by INPFC regions (Columbia and US-Vancouver areas and Eureka, Monterey, and Conception areas) and by latitude (North of 42° and South of 42 °). The Council's specified ABC alternatives for 2007 and 2008 are 6,706 mt and 5,853 mt, respectively.

Longspine Thornyhead

The OY alternatives specified for analysis for longspine thornyhead are 2,696 mt and 3,930 mt (Table 2-1). This compares to the status quo OY of 2,656 mt for 2005 and 2006. The first alternative, 2,696 mt, is based on assuming constant density throughout the Conception area and the proportion of the area north and south of Pt. Conception (21% of the Conception area) with a 25% precautionary reduction. The second alternative, 3,930 mt, is based on assuming constant density throughout the Conception area and the proportion of the area north and south of Pt. Conception (21% of the Conception area). As a healthy stock, the OY can be set equal to the ABC, which is how the second alternative was calculated. The OYs are also subdivided by latitude based on a GMT-recommended alternative where harvest guidelines north and south of 34°27' N latitude are analyzed. However the status quo alternative OYs for 2005 and 2006 were specified north and south of 36° N latitude. The Council's specified ABC alternatives for 2007 and 2008 are 3,953 mt and 3,860 mt, respectively.

Shortbelly Rockfish

Shortbelly rockfish is unexploited due to its small size, except as infrequent incidental catch. The 13,900 mt ABC/OY is a continuation of a conservative Council policy for this species based on its last assessment in 1989. Since that assessment, the peak one-year shortbelly landings have been <100 mt.

Shortspine Thornyhead

The shortspine thornyhead OY alternatives specified for analysis are 1,661 mt and 2,476 mt (Table 2-1). This compares to the status quo OY of 1,055 mt for 2005 and 1,077 mt for 2006. The coastwide OYs are the sum of OYs determined for north and south of Pt. Conception (34°27' N latitude). The Council's specified ABC alternatives for 2007 and 2008 are 2,488 mt and 2,463 mt, respectively.

For alternative 1, the OY for the area south of Pt. Conception is based on the base case assessment scenario in the 2005 stock assessment {Hamel 2005}, which indicated that 34% of the coastwide biomass is in this area, and with a 50% reduction to account for the paucity of survey data south of Pt. Conception. The 50% reduction is due to the SSC conclusion the assessment is marginally sufficient to estimate resource status given the short duration and density of survey data south of Pt. Conception. The base case model assumed $h = 0.6$ and $q = 1.0$. The OY alternative 1 for the area north of Pt. Conception based on the base case assessment result indicating 66% of the coastwide biomass is in this area with a 25% precautionary reduction. The 25% precautionary reduction is due to the SSC conclusion the assessment is marginally sufficient to estimate resource status. The base case model assumed $h = 0.6$ and $q = 1.0$.

Alternative 2 OYs (for north and south of 34°27' N latitude) are based on the same biomass estimates from the 2005 stock assessment base case model, but with no precautionary reduction. Therefore, the OY alternative for the area south of Pt. Conception (841 mt) is based on an estimate of 34% coastwide biomass is in this area and the OY alternative for the north portion (1,634 mt) is based on an estimate of the remaining 66% of the coastwide biomass.

Splitnose Rockfish

As in 2005-2006, the ABC of 615 mt is reduced to an OY of 461 mt based on the Council's policy of making a 25% precautionary OY adjustment for species with less rigorous stock assessments. These harvest specifications are for south of 40°10' N latitude since splitnose rockfish are managed as part of the northern minor slope rockfish complex north of 40°10' N latitude.

Starry Flounder

Starry flounder was assessed for the first time in 2005 and is now proposed to be managed with a separate ABC and OY. Previously the stock has been managed as a component stock of the Other Flatfish complex. Therefore, there are no status quo ABC or OY alternatives for the stock. The Council requested the following two OY alternatives for analysis: 890 mt and 1,186 mt (Table 2-1). Alternative 1 (890 mt) is based on a 25% reduction of the combined area OYs from the base model in the stock assessment {Ralston 2005} as a result of the 25% precautionary reduction for data poor stocks. Alternative OY 2 (1,186 mt) is based on the combined area OYs from the based model in the stock assessment. The ABC alternatives identified by the Council are 1,221 mt for 2007 and 1,395 mt for 2008.

Yellowtail Rockfish

Yellowtail rockfish is a healthy rockfish stock that had a new stock assessment in 2005{Lai 2006}. Year-specific ABCs were projected following the Council's policy of using an $F_{50\%}$ harvest rate as a proxy for F_{MSY} for rockfish; the 2007 ABC for this species is 4,585 mt and the 2008 ABC is 4,510 mt. These ABCs were averaged (4,548 mt) and specified for both years. The OYs were set equal to ABC because the stock is above $B_{40\%}$. The GMT notes that the fisheries have not been attaining yellowtail rockfish harvest levels in recent years because its harvest has been constrained to protect co-occurring depleted species.

2.1.4 Unassessed Groundfish Species and Those Managed as Part of a Stock Complex

2.1.4.1 Minor Rockfish South

The Council has identified four minor rockfish south OY alternatives for analysis: 1,753 mt, 1,855 mt, 1,898 mt, and 2,006 mt (Table 2-1). The OY alternatives calculated for nearshore species, shelf species, and slope species sum to equal the overall minor rockfish south value. The overall OY alternatives for 2007-2008 compare to the status quo OY of 1,968 mt.

The ABC alternative identified by the Council for analysis is 3,403 mt; this compares to a status quo ABC alternative of 3,412 mt for 2005 and 2006. The ABC alternative for 2007 and 2008 reflects three adjustments to account for the reassessment of blackgill rockfish and the new assessments for gopher rockfish and California scorpionfish. First, the status quo contribution of blackgill rockfish to the ABC (343 mt) was removed from the complex ABC and replaced with the new blackgill ABC/OY of 292 mt (based on the 2007-2008 average ABC/OY); this results in an overall reduction of 51 mt. Second, the status quo contribution of gopher rockfish (97 mt) was removed and replaced with the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY), resulting in an overall increase of 205 mt. Third, the status quo contribution of California scorpionfish (163 mt) was removed from the ABC as this species will now be managed under its own ABC/OY.

Minor Nearshore Rockfish Species

The complex, Minor Nearshore Rockfish south of 40°10' N latitude, is further subdivided into the following management categories: 1) shallow nearshore rockfish [comprised of black and yellow rockfish (*S. chrysomelas*); China rockfish (*S. nebulosus*); gopher rockfish (*S. carnatus*); grass rockfish (*S. rastrelliger*), and kelp rockfish (*S. atrovirens*)]; 2) deeper nearshore rockfish: [comprised of black rockfish (*S. melanops*), blue rockfish (*S. mystinus*); brown rockfish (*S. auriculatus*); calico rockfish (*S. dalli*); copper rockfish (*S. caurinus*); olive rockfish (*S. serranoides*); quillback rockfish (*S. maliger*); and treefish (*S. serriceps*)] and 3) California scorpionfish (*Scorpaena guttata*).

The Council adopted a southern minor nearshore rockfish species OY for 2003 of 541 mt. This OY was based upon the Groundfish FMP policy for specifying OYs for unassessed species using 50% of recent landings, and was recalculated from the 2001-2002 OY of 662 mt using updates estimates of recreational and commercial harvest. For the 2004 southern minor nearshore rockfish species OY, an adjustment was made to account for removal of black rockfish; however this adjustment started with the 2002 OY of 662 mt and not the 2003 OY of 541 mt. The resulting OY of 615 mt was adopted by the Council for 2004 for the 2005-2006 management cycles. For the 2007-2008 management cycle, the Minor Nearshore Rockfish South is corrected by subtracting the black rockfish OY of 47 mt from the 541 mt OY, resulting in a value of 494 mt.

This initial value for the southern minor nearshore rockfish species OY is then adjusted to account for the new California scorpionfish and gopher rockfish assessments. The current contribution for California scorpionfish of 81.5 mt is removed from the combined OY. Because gopher rockfish cannot be managed separately from other nearshore rockfish species without significantly increasing bycatch and because of uncertainty regarding the assessment because of its poor data quality, gopher rockfish will remain in the southern minor nearshore rockfish species OY and will have a point of concern set at a level determined appropriate to the adopted OY. The following four alternatives different methods for accounting for these changes.

The 413 mt OY alternative includes the 48.5 mt contribution of gopher rockfish (494 mt minus the California scorpionfish contribution of 81.5 mt equals 413 mt). OY alternative 2 is determined by removing the current contribution for gopher rockfish (48.5 mt) from the OY and then increasing the OY by 50% of the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY; 2007 = 340 mt, 2008 = 264 mt); this calculation leads to a value of 515 mt. The 558 mt OY alternative is determined by removing the current contribution for gopher rockfish (48.5 mt) from the OY and then increasing the OY by 75% of the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY; 2007 = 340 mt, 2008 = 264 mt). OY alternative 4 is determined by removing the current contribution for gopher rockfish (48.5 mt) from the OY and then increasing the OY by the new gopher ABC/OY of 302 mt (based on the 2007-2008 average ABC/OY; 2007 = 340 mt, 2008 = 264 mt); this calculation leads to an OY value of 666 mt. These four OY alternatives compare to the status quo OY alternative of 615 mt for 2004-2005, for which the calculation is discussed earlier.

Minor Shelf Rockfish Species

The minor shelf rockfish complex south of 40°10' N latitude is composed of the following species: bronzespotted rockfish (*S. gilli*); chameleon rockfish (*S. phillipsi*); dusky rockfish (*S. ciliatus*); dwarf-red rockfish (*S. rufianus*); flag rockfish (*S. rubrivinctus*); freckled rockfish (*S. lentiginosus*); greenblotched rockfish (*S. rosenblatti*); greenspotted rockfish (*S. chlorostictus*); greenstriped rockfish (*S. elongatus*); halfbanded rockfish (*S. semicinctus*); harlequin rockfish (*S. variegatus*); honeycomb rockfish (*S. umbrosus*); Mexican rockfish (*S. macdonaldi*); pink rockfish (*S. eos*); pinkrose rockfish (*S. simulator*); pygmy rockfish (*S. wilsoni*); redstripe rockfish (*S. proriger*); rosethorn rockfish (*S. helvomaculatus*); rosy rockfish (*S. rosaceus*); silvergray rockfish (*S. brevispinis*); speckled rockfish (*S. ovalis*); squarespot rockfish (*S. hopkinsi*); starry rockfish (*S. constellatus*); stripetail rockfish (*S.

saxicola); swordspine rockfish (*S. ensifer*); tiger rockfish (*S. nigrocinctus*); vermilion rockfish (*S. miniatus*); and yellowtail rockfish (*S. flavidus*).

The Council has identified the status quo ABC and OY as the only alternative to be analyzed for 2007-2008 management cycle. The OY is set to the ABC; therefore, the ABC alternative and OY alternative for analysis are both 714 mt.

Minor Slope Rockfish Species

The minor slope rockfish complex south of 40°10' N latitude is composed of the following species: aurora rockfish (*S. aurora*); bank rockfish (*S. rufus*); blackgill rockfish (*S. melanostomus*); Pacific ocean perch (*S. alutus*); redbanded rockfish (*S. babcocki*); rougheye rockfish (*S. aleutianus*); sharpchin rockfish (*S. zacentrus*); shortraker rockfish (*S. borealis*); and yellowmouth rockfish (*S. reedi*).

The Council identified one ABC/OY alternative for this complex: 626 mt. This value was determined by the following calculation: the status quo contribution of blackgill (305 mt) was removed from the complex and replaced with the new blackgill ABC/OY of 292 mt (based on the 2007-2008 average ABC/OY; 2007 = 294 mt, 2008 = 290 mt). This alternative compares to the status quo alternative ABC/OY of 639 mt.

2.1.4.2 Minor Rockfish North

The Council has identified three minor rockfish north OY alternatives for analysis: 2,250 mt, 2,270 mt, and 2,290 mt (Table 2-1). The OY alternatives calculated for nearshore species, shelf species, and slope species sum to equal the overall minor rockfish north values. The overall OY alternatives for 2007-2008 compare to the status quo OY of 2,250 mt. The Council identified the status quo ABC alternative, 3,680 mt, to be evaluated for the 2007-2008 management cycle.

Minor Nearshore Rockfish Species

The minor nearshore rockfish complex north of 40°10' N latitude is composed of the following species: black and yellow rockfish (*S. chrysomelas*); blue rockfish (*S. mystinus*); brown rockfish (*S. auriculatus*); calico rockfish (*S. dalli*); China rockfish (*S. nebulosus*); copper rockfish (*S. caurinus*); gopher rockfish (*S. carnatus*); grass rockfish (*S. rastrelliger*); kelp rockfish (*S. atrovirens*); olive rockfish (*S. serranoides*); quillback rockfish (*S. maliger*); and treefish (*S. serriceps*).

When black rockfish was originally removed from the northern minor nearshore rockfish OY, a ratio of black to blue rockfish catch was used to determine what proportion of that OY was attributable to black rockfish. However, due to the variability of blue rockfish catches, there is some concern that this ratio (92%:8% black to blue rockfish) under-represents blue rockfish catch and therefore the resulting OY (since black rockfish is managed separately). To account for this uncertainty (that is, a range of possible levels of black rockfish removal from the OY), three alternatives have been identified by the Council. OY alternative 1 is equal to the status quo OY alternative of 122 mt. OY alternative 2 (142 mt) is equal to the status quo OY alternative plus 20 mt. OY alternative 3 (162 mt) is equal to the status quo OY alternative plus 40 mt.

Minor Shelf Rockfish Species

The minor shelf rockfish complex north of 40°10' N latitude is composed of the following species:

bronzespotted rockfish (*S. gilli*); bocaccio (*Sebastes paucispinis*); chameleon rockfish (*S. phillipsi*); chilipepper rockfish (*S. goodei*); cowcod (*S. levis*); dusky rockfish (*S. ciliatus*); dwarf-red rockfish (*S. rufianus*); flag rockfish (*S. rubrivinctus*); freckled rockfish (*S. lentiginosus*); greenblotched rockfish (*S. rosenblatti*); greenspotted rockfish (*S. chlorostictus*); greenstriped rockfish (*S. elongatus*); halfbanded rockfish (*S. semicinctus*); harlequin rockfish (*S. variegatus*); honeycomb rockfish (*S. umbrosus*); Mexican rockfish (*S. macdonaldi*); pink rockfish (*S. eos*); pinkrose rockfish (*S. simulator*); pygmy rockfish (*S. wilsoni*); redstripe rockfish (*S. proriger*); rosethorn rockfish (*S. helvomaculatus*); rosy rockfish (*S. rosaceus*); silvergray rockfish (*S. brevispinis*); speckled rockfish (*S. ovalis*); squarespot rockfish (*S. hopkinsi*); starry rockfish (*S. constellatus*); stripetail rockfish (*S. saxicola*); swordspine rockfish (*S. ensifer*); tiger rockfish (*S. nigrocinctus*); and vermilion rockfish (*S. miniatus*).

No change from status quo was identified by the Council for analysis; therefore the status quo ABC/OY alternative for northern minor shelf rockfish species, 968 mt, is analyzed for the 2007-2008 management cycle (Table 2-1).

Minor Slope Rockfish Species

The minor slope rockfish complex north of 40°10' N latitude is composed of the following species: aurora rockfish (*S. aurora*); bank rockfish (*S. rufus*); blackgill rockfish (*S. melanostomus*); redbanded rockfish (*S. babcocki*); rougheye rockfish (*S. aleutianus*); sharpchin rockfish (*S. zacentrus*); shortraker rockfish (*S. borealis*); splitnose rockfish (*S. diploproa*); and yellowmouth rockfish (*S. reedi*).

No change from status quo is identified by the Council for analysis; therefore the status quo ABC/OY alternative for northern minor slope rockfish species, 1,160 mt, is analyzed for the 2007-2008 management cycle (Table 2-1).

2.1.4.3 Other Unassessed Species

Pacific Cod

No change from status quo is identified by the Council for analysis. As in 2005-2006, the Pacific cod ABC of 3,200 mt is based on historic landings levels, with the 1,600 mt OY representing the Council's precautionary 50% adjustment for unassessed species (Table 2-1).

Other Fish

The Other Fish stock complex contains all the unassessed Groundfish FMP species that are neither rockfish (family *Scorpaenidae*) nor flatfish. These species include big skate (*Raja binoculata*), California skate (*Raja inornata*), leopard shark (*Triakis semifasciata*), longnose skate (*Raja rhina*), soupfin shark (*Galeorhinus zyopterus*), spiny dogfish (*Squalus acanthias*), finescale codling (*Antimora microlepis*), Pacific rattail (*Coryphaenoides acrolepis*), ratfish (*Hydrolagus colliei*), cabezon (*Scorpaenichthys marmoratus*) (north of the California-Oregon border at 42° N latitude), and kelp greenling (*Hexagrammos decagrammus*).

No change from status quo is identified by the Council for analysis. The OY alternative is 7,300 mt and the ABC alternative is 14,600 mt (Table 2-1).

Other Flatfish

The Other Flatfish complex contains all the unassessed flatfish species in the Groundfish FMP. These species include butter sole (*Isopsetta isolepis*), curlfin sole (*Pleuronichthys decurrens*), flathead sole (*Hippoglossoides elassodon*), Pacific sanddab (*Citharichthys sordidus*), rex sole (*Glyptocephalus zachirus*), rock sole (*Lepidopsetta bilineata*), and sand sole (*Psettichthys melanostictus*).

The Council has identified an OY alternative of 4,884 mt to be analyzed. This OY is based on the ABC with a 25% precautionary reduction for sanddabs and rex sole and a 50% precautionary reduction for the remaining species. The starry flounder contribution is removed (25 mt). The status quo OY alternative is 4,909 mt for 2005 and 2006.

The Council has identified an ABC alternative of 6,731 mt to be analyzed for 2007 and 2008. This ABC alternative is based on the following historical catch levels: the highest landings of Pacific sanddabs (in 1995) and rex sole (in 1982) for the 1981-2003 period and on average landings during 1994-1998 for the remaining Other Flatfish species. The starry flounder contribution is removed (50 mt). The status quo ABC alternative is 6,781 mt for 2005 and 2006.

2.1.5 Alternative Harvest Levels Considered, But Eliminated From Detailed Study

The new darkblotched rebuilding analysis indicates some otherwise viable OY alternatives exceed the ABC, which is based on a proxy F_{MSY} harvest rate. However, a stock's OY cannot legally exceed the ABC, which for darkblotched is 456 mt and 486 mt in 2007 and 2008, respectively. Therefore, OY Alt. 5 (472 mt) can only be considered in 2008 as a year-specific OY. Since the Council intends to average the darkblotched OY from rebuilding analysis projections and specify the same average OY for 2007 and 2008, OY Alternative 5 is eliminated from detailed study.

Yelloweye OY Alternatives specified by the Council in November 2005 for analysis were based on the 2005 rebuilding analysis by Tsou and Wallace (2005)[8]. However, a new yelloweye assessment and rebuilding analysis were adopted as the best available science by the Council in 2006. The new rebuilding analysis {Tsou and Wallace 2006} indicates a 2007-2008 OY ≥ 15 mt for yelloweye would result in a less than a 50% probability of rebuilding by T_{MAX}, which is not legally viable. Therefore, OY Alternatives 3-6 under a constant harvest rate rebuilding strategy are eliminated from further study in this EIS.

2.2 Alternative Management Measures

2.2.1 Catch Sharing Options

2.2.1.1 Research Catches

Under the Magnuson-Stevens Act and the Pacific Coast Groundfish FMP, the term fishing refers to the catching, taking, or harvesting of fish; the attempted catching, taking, or harvesting of fish; any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or any operations at sea in support of, or in preparation for the catching, taking, or harvesting of fish. Activity by a vessel conducting authorized scientific research is not considered fishing under the Magnuson-Stevens Act or the Pacific Coast Groundfish FMP. However, nothing within the Magnuson-Stevens Act or the Pacific Coast Groundfish FMP is intended to inhibit or prevent any scientific research activity

[8] Since the 2005 yelloweye assessment (Wallace et al. 2005) and rebuilding analysis (Tsou and Wallace 2005) were superseded by the 2006 assessment (Wallace et al. 2006) and rebuilding analysis (Tsou and Wallace 2006), they were not published in a Stock Assessment and Fishery Evaluation document. However, these documents are posted on the Council's web site at pcouncil.org for those who are interested.

conducted by a scientific research vessel.

The federal regulations, § 600.310 (f)(4)(iii) require that fishing mortality be counted against the OY, including that resulting from bycatch, scientific research, and other fishing activities. In past years, prior to the establishing harvest guidelines for fishing activities, the Council has set aside a portion of the OY for each stock of stock complex projected to be taken by vessels conducting scientific research. The projected amounts were based on the most recent years' research catch summaries and were modified to account for changes in research activities between years. Because the research catch amounts are projections, the catch levels have on occasion been modified during the year when the catch of a constraining overfished species was higher than originally projected.

Table 2-4 summarizes the scientific research catch for 2005. Research catch projections for the overfished species are presented in the estimated mortality impact tables (i.e., bycatch scorecards) that have been prepared for each alternative. For 2007 and 2008, the depleted species' research catch projections are held constant under the different alternatives with the exception of yelloweye rockfish. Yelloweye rockfish values are increased over previous years in response to an increase in survey stations in the IPHC's annual Pacific Halibut longline survey. The additional survey stations are in yelloweye rockfish habitat and are expected to provide much needed fishery independent biological data on yelloweye. However, under the Preferred Low OY alternatives for depleted species, the new IPHC survey stations are not included. The values for bocaccio, widow and canary rockfish are based on the summary of research catch in 2005. These values were rounded up given the understanding that the biomass levels for these stocks are increasing and therefore, they will be more likely to be taken in research catches. Cowcod projections are also based on the summary of 2005 research catch. Although the total research catch in 2005 for darkblotched rockfish and POP was lower than originally projected, the research catch amounts for 2007 and 2008 are the same as those set aside at the beginning of 2005. The catch of these species varies considerably between years (darkblotched rockfish: 5.14 mt in 2003, 0.08 in 2004, and 2.08 mt in 2005; POP: 5.0 mt in 2003, 0.35 mt in 2004, 1.84 mt in 2005). In addition, the biomass levels for these stocks are increasing and they are more likely to be taken in research catches.

2.2.1.2 Exempted Fishing Permit Catches

This section will be completed after 2007 EFP applications are received by the Council in June 2006, at which time the Council may decide to specify EFP bycatch caps or a set-aside yield of groundfish species to allow 2007 EFPs to proceed.

2.2.2 New Management Lines

New management lines being considered for 2007-2008 include a 10 fm line in Washington to manage recreational fisheries, a 20 fm line in Washington and Oregon for managing recreational and nearshore commercial fisheries[9], a 25 fm line in Washington Marine Areas 1 and 2 (from the Oregon/Washington border to the Queets River) for managing the Washington recreational fishery, a 180 fm line modified for petrale sole fishing areas in California (south of 42º N latitude to US/Mexico border) to provide for winter petrale fishing, a 250 fm line south of 38º N latitude for use in managing commercial slope fisheries, and an accompanying 250 fm line modified for petrale sole fishing areas south of 38º N latitude.

The Oregon Department of Fish and Wildlife is proposing a 25 fm RCA line for Council adoption. This line would replace the current 27 fm RCA line in regulation. Due to the geography of the coast, and the methods by which these lines were drawn, there is little difference in area between the 25 fm RCA line and the 27 fm RCA line. This would, however, provide consistency in groundfish regulations between Washington and Oregon, as there would be a continuous 25 fm RCA line beginning at the Queets River and continuing to the Oregon/California border, thus simplifying regulations and providing RCA line consistency to the fishing community.

Additionally, the GMT intends to review the existing petrale sole fishing areas used to manage limited entry trawl fisheries during periods 1 and 6 and may recommend modifications to the boundaries defining these Groundfish Fishing Areas. Any coordinates defining new management lines are anticipated to be provided at the June 2006 Council meeting in Foster City, California.

9 The new 20 fm line in Washington and Oregon is expected to be formally defined with waypoints for 2007-2008 to better enforce any 20 fm depth restriction that might be implemented. California has been managing their recreational and nearshore commercial fisheries with a 20 fm depth restriction regionally, but this regulation is specified referencing depth contours rather than a defined line using latitude/longitude coordinates or waypoints. This was adopted because the majority of the 20 fm depth contour is within state waters, with the exception of an area off of San Francisco over sandy habitat where depleted rockfish (e.g., bocaccio) are not expected to be encountered. This nearshore depth contour winds along a rugged coastline and is considered by CDFG enforcement to be more successfully enforced as a depth contour. Therefore, CDFG intends to continue managing the 20 fm depth restriction by contours.

Table 2-4. Summary of total catch (mt) data from scientific fishing in 2005.

Species	Post-capture behavior and mortality of important bycatch species	Ultrasonic camera examinations of interactions between groundfish and fishing gear	Northwest Fisheries Science Center to conduct a pre-recruit hake survey	Northwest Fisheries Science Center annual bottom trawl survey	U.S. – Canada Joint Pacific Hake Echo Integration Trawl Survey	Northwest Fisheries Science Center integrated study of the ecology of pre-recruit fish	International Pacific Halibut Commission - Pacific Halibut Longline Survey	Pacific Coast Groundfish Conservation Trust - Canary Rockfish Survey	**Total (mt)**
ROUNDFISH:									
Lingcod			0.00	4.00	0.01		0.22	0.20	**4.54**
Pacific Cod				0.21	0.00		0.02		**0.23**
Pacific Whiting		1.77	0.06	15.41	43.58	0.00	0.05		**60.86**
Sablefish N. of 36° N. lat.	0.00	0.76	0.00	7.56			7.24		**15.56**
Sablefish S. of 36° N. lat.				2.17					**2.17**
Cabezon			0.00	0.00					**0.00**
FLATFISH:									
Dover Sole		1.71		28.12	0.00				**29.83**
English Sole	0.00			4.39					**4.39**
Petrale Sole				3.51					**3.51**
Arrowtooth Flounder		0.52		5.47	0.01		0.05	0.00	**6.05**
Other Flatfish	0.01	0.17	0.00	13.28		0.01	0.01		**13.48**
ROCKFISH:									
Pacific Ocean Perch		0.02		1.26	0.56				**1.84**
Shortbelly			0.00	8.20	0.01				**8.21**
Widow			0.00	0.19	0.85	0.00		0.00	**1.11**
Canary			0.00	1.47	0.01	0.00	0.02	0.79	**2.32**
Chilipepper (South)			0.00	13.07	0.19				**13.37**
Bocaccio (South)				0.40	0.00			0.01	**1.69**
Splitnose (South)				2.68	1.63				**4.31**
Yellowtail (North)			0.00	3.23	1.35		0.01	0.14	**4.73**
Shortspine Thornyhead		0.87		3.81			0.01		**4.68**
Longspine Thornyhead N. of 36° N. lat.				9.40					**9.40**
Longspine Thornyhead S. of 36° N. lat.				0.94					**0.94**
Cowcod - Conception				0.01					**0.08**
Cowcod - Monterey				0.02					**0.02**
Darkblotched		0.02	0.00	2.05	0.01	0.00	0.00		**2.08**
Yelloweye				0.07			0.47	0.11	**0.64**
Black Rockfish			0.00	0.00	0.01		0.00	0.00	**0.01**

Table 2-4. Summary of total catch (mt) data from scientific fishing in 2005 (continued).

Species	Post-capture behavior and mortality of important bycatch species	Ultrasonic camera examinations of interactions between groundfish and fishing gear	Northwest Fisheries Science Center to conduct a pre-recruit hake survey	Northwest Fisheries Science Center annual bottom trawl survey	U.S. – Canada Joint Pacific Hake Echo Integration Trawl Survey	Northwest Fisheries Science Center integrated study of the ecology of pre-recruit fish	International Pacific Halibut Commission - Pacific Halibut Longline Survey	Pacific Coast Groundfish Conservation Trust - Canary Rockfish Survey	Total (mt)
MINOR ROCKFISH NORTH				10.68	0.03				**10.71**
Remaining Rockfish North				6.61					**6.61**
Bocaccio			0.00	0.02	0.02		0.00	0.02	**0.07**
Chilipepper				1.12	0.05				**1.18**
Redstripe		0.00		0.06	0.10	0.00		0.01	**0.17**
Sharpchin			0.00	3.04					**3.04**
Silvergrey				0.10	0.03		0.00		**0.13**
Splitnose		0.53		2.24					**2.77**
Yellowmouth				0.04	0.57		0.00		**0.60**
Other Rockfish North		0.17	0.00	4.06			0.22	0.05	**4.50**
MINOR ROCKFISH SOUTH				8.11					**10.38**
Remaining Rockfish South				0.35					**0.53**
Bank				0.02					**0.06**
Blackgill				0.26					**0.27**
Sharpchin				0.00					**0.00**
Yellowtail				0.07				0.24	**0.44**
Other Rockfish South				7.76					**9.66**
Unidentifiable Rockfish						0.01			**0.01**
SHARKS/SKATES/RATFISH/GRENADIERS/KELP GREENLING									
Kelp Greenling				0.02					**0.02**
Spiny Dogfish		0.01	0.00	8.71	0.61	0.00	5.47		**14.81**
Other Groundfish		0.11		15.96	0.44		2.27	0.10	**18.88**

2.2.3 Description of the Management Measure Alternatives

2.2.3.1 The No Action Alternative

The No Action Alternative is described by the 2005 and 2006 management measures specified in federal and state regulations. All of the action alternatives described in this chapter will be compared to the No Action Alternative. Some of these management measures were changed beginning in 2006 in reaction to problems that arose in managing the 2005 fishery. While 2005 management measures, including inseason adjustments, will be described in detail, the 2006 management measures and projected impacts will be the central focus when comparing all action alternatives to the No Action Alternative. Projected impacts of depleted groundfish species under the No Action Alternative are depicted in Table 2-5.

Table 2-5. Projected mortality (mt) of depleted groundfish species by fishing sector in 2006.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	47.4	7.8	**2.7**	160.3	63.3	1.0	0.3
Limited Entry Trawl- Whiting							
At-sea whiting motherships				4.7	1.0		0.0
At-sea whiting cat-proc		4.7		6.3	2.9	200.0	0.0
Shoreside whiting				5.2	1.8		0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9
Open Access: Directed Groundfish	10.6	3.0	0.1	0.2	0.1	0.1	3.0
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.0	0.3	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish d/							
WA		8.5					6.7
OR						1.4	
CA	60.0	9.3	0.4			7.0	3.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	2.0	3.0	0.1	3.8	3.6	0.9	1.0
Non-EFP Total	134.7	44.3	3.4	181.9	73.7	257.3	20.3
EFPs e/							
CA early season whiting S. of 40°10'	0.3	0.1	0.0	0.2	0.0	0.4	0.0
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	134.7	44.3	3.4	181.9	73.7	257.3	20.3
2006 OY	**309**	**47.0**	**4.2**	**200**	**447**	**289**	**27**
Difference	174.3	2.7	0.8	18.2	373.3	31.7	6.7
Percent of OY	43.6%	94.2%	81.0%	90.9%	16.5%	89.0%	75.1%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish. This suggests that total bocaccio was caught in trace amounts.

d/ Values for canary and yelloweye rockfish represent specified harvest guidelines.

e/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

2.2.3.1.1 Limited Entry Trawl Fisheries

Non-Whiting Trawl Fishery

The 2006 trawl trip limits and seasonal RCA configurations (as of May 2006) describe the No Action Alternative and are shown in Tables 2-6a (north of 40°10' N latitude) and 2-6b (south of 40°10' N latitude).

A new management measure implemented in 2005 was mandating the use of selective flatfish trawls shoreward of the trawl RCA north of 40°10' N latitude. The selective flatfish trawl, configured with a cut-back headrope, a low rise, and a small (≤ 8 in. diameter) footrope, is designed to reduce rockfish bycatch while efficiently catching flatfish. The selective flatfish trawl works by allowing rockfish to escape by swimming upward when they encounter the trawl. Flatfish tend to dive down when disturbed, which accounts for the differential selectivity of these trawls to rockfish and flatfish.

In 2005 the non-whiting bottom trawl fishery was constrained with lower slope rockfish trip limits and a larger RCA with a seaward boundary of 200 fm north of 40°10' N latitude in response to a problem with early attainment of the darkblotched rockfish OY in 2004. The period 6 opportunity to harvest petrale sole was also lost in 2004 when the fishery was closed out to 250 fm to minimize further darkblotched rockfish impacts. One consequence of these 2004 management actions was a pent-up demand for petrale sole when the fishery re-opened in 2005. Coupled with this market demand, there was fair winter weather in the north and an abnormal distribution of petrale sole in 2005, which led to an early attainment and exceedance of the petrale sole OY. In response, there was a trip limit imposed on petrale sole in period 1 of 2006, which, in previous years, had been unlimited in periods 1 and 6. The more conservative slope rockfish trip limits and trawl RCA configuration were also re-specified for 2006 to avoid the darkblotched rockfish impacts observed in 2004. And, in a good faith effort to respond to the Ninth Circuit Court of Appeals ruling in a challenge to the darkblotched rockfish rebuilding plan (see section 1.3.1), the Council and NMFS adopted a lower 200 mt darkblotched rockfish OY for 2006 in an emergency rulemaking. This compares to the previously specified darkblotched rockfish OY of 294 mt.

Another change in limited entry trawl management measures from 2005 was the specification of cumulative trip limits for Pacific cod and spiny dogfish beginning in March 2006 (period 2). The Pacific cod ABC of 3,200 mt was based on historical landings since the stock has not been formally assessed. The Pacific cod OY was reduced by half from the ABC beginning in 2005 on the GMT's recommendation and in accordance with the precautionary policy for unassessed stocks {Restrepo et al. 1998 /ft "see FMP §4.6.2"}. In 2004, prior to the precautionary OY reduction, the total mortality of Pacific cod was greater than the current OY of 1,600 mt. Therefore, the Council and NMFS adopted a Pacific cod trip limit beginning in 2006 (Tables 2-6a and 2-6b); previously allowable landings were unlimited. A spiny dogfish trip limit was also specified beginning in 2006 to address conservation concerns and the depleted species' bycatch implications associated with targeting this stock in the open access fishery (see section 2.2.3.1.3 below for more details). Tables 2-6a and 2-6b depict the 2006 spiny dogfish trip limits.

Although not much bottom trawling is done south of Pt. Conception at 34°27' N latitude in the Southern California Bight, bottom trawling and other bottom fishing activities are prohibited in two discrete areas called the Cowcod Conservation Areas (Figure 2-3).

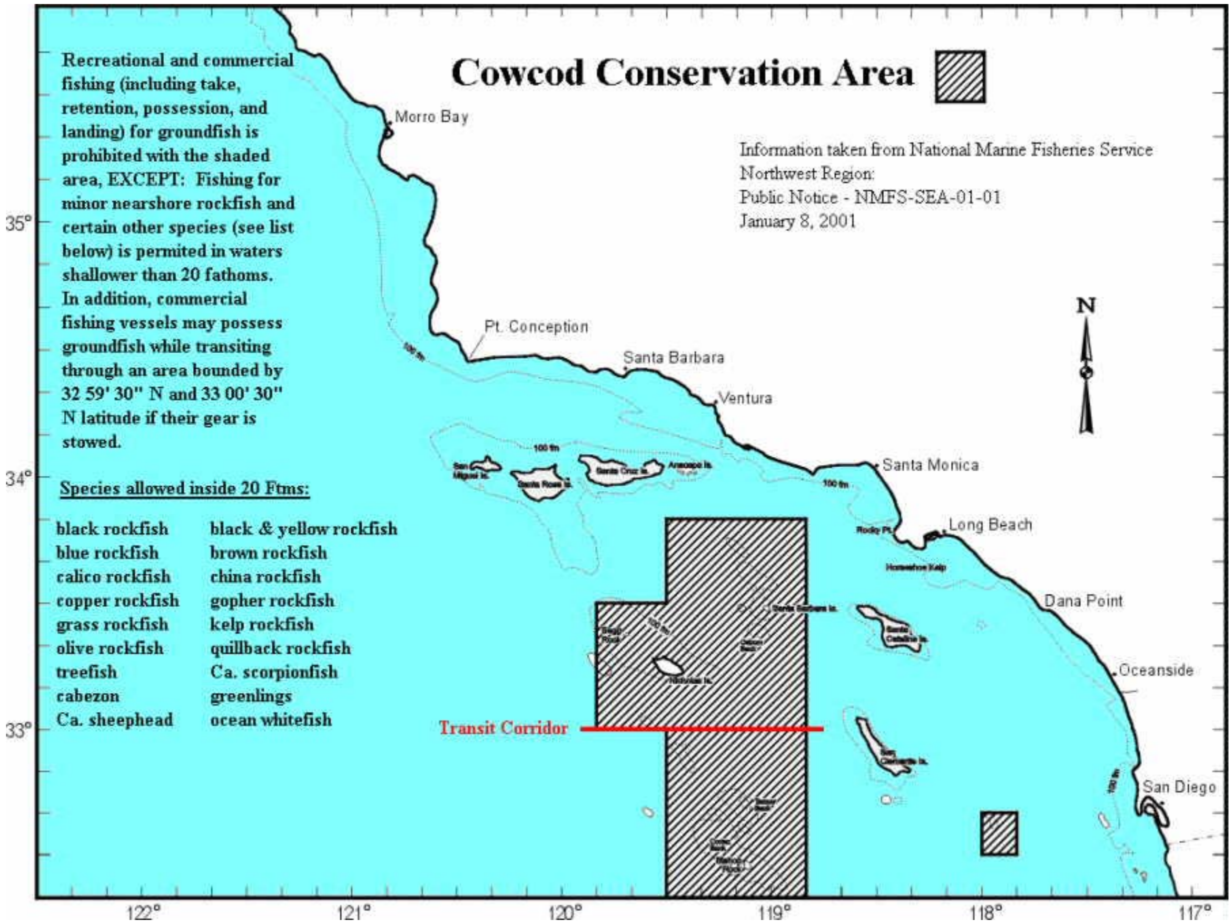

Figure 2-3. The current Cowcod Conservation Areas located in the Southern California Bight.

Whiting Trawl Fishery

The Pacific whiting OY of 269,069 mt, used to manage the 2005 and 2006 West Coast whiting fisheries, forms the basis for the No Action Alternative. The specific 2006 whiting harvest specifications are a coastwide (U.S. + Canada) ABC of 661,680 mt, a coastwide (U.S. + Canada) OY of 364,842 mt, and a U.S. OY of 269,069 mt. The U.S. OY of 269,069 mt is divided by first setting aside the tribal allocation

Table 2-6a. 2006 Trip limits for limited entry trawl gears north of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6]: North of 40°10' N. lat.	75 fm - modified 200 fm [7]		75 - 200 fm		100 - 200 fm	75 fm - 200 fm	75 fm - modified 200 fm [7]
	Selective flatfish trawl gear is required shoreward of the RCA; all trawl gear (large footrope, selective flatfish trawl, and small footrope trawl gear) is permitted seaward of the RCA. Midwater trawl gear is permitted only for vessels participating in the primary whiting season.							
	See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).							
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.							
1	**Minor slope rockfish[2] & Darkblotched rockfish**	2,000 lb/ month		4,000 lb/ 2 months				
2	**Pacific ocean perch**	1,500 lb/ month		3,000 lb/ 2 months				
3	**DTS complex**							
4	Sablefish							
5	large & small footrope gear	7,000 lb/ month		14,000 lb/ 2 months	20,000 lb/ 2 months			14,000 lb/ 2 months
6	selective flatfish trawl gear	2,500 lb/ month		7,000 lb/ 2 months	13,500 lb/ 2 months		7,000 lb/ 2 months	5,000 lb/ 2 months
7	multiple bottom trawl gear [8]	2,500 lb/ month		7,000 lb/ 2 months	13,500 lb/ 2 months		7,000 lb/ 2 months	5,000 lb/ 2 months
8	Longspine thornyhead							
9	large & small footrope gear	7,500 lb/ month		15,000 lb/ 2 months	23,000 lb/ 2 months			15,000 lb/ 2 months
10	selective flatfish trawl gear	1,500 lb/ month		3,000 lb/ 2 months				
11	multiple bottom trawl gear [8]	1,500 lb/ month		3,000 lb/ 2 months				
12	Shortspine thornyhead							
13	large & small footrope gear	2,000 lb/ month		4,000 lb/ 2 months	5,800 lb/ 2 months			4,000 lb/ 2 months
14	selective flatfish trawl gear	1,500 lb/ month		3,000 lb/ 2 months				
15	multiple bottom trawl gear [8]	1,500 lb/ month		3,000 lb/ 2 months				
16	Dover sole							
17	large & small footrope gear	25,000 lb/ month		50,000 lb/ 2 months	35,000 lb/ 2 months			
18	selective flatfish trawl gear	10,000 lb/ month		28,000 lb/ 2 months				20,000 lb/ 2 months
19	multiple bottom trawl gear [8]	10,000 lb/ month		28,000 lb/ 2 months				20,000 lb/ 2 months

Table 2-6a. 2006 Trip limits for limited entry trawl gears north of 40°10' N latitude (continued).

#		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]: North of 40°10' N. lat.	75 fm - modified 200 fm [7/]		75 - 200 fm		100 - 200 fm	75 fm - 200 fm	75 fm - modified 200 fm [7/]
20	**Flatfish** (except Dover sole)							
21	Other flatfish [3/], English sole & Petrale sole							
22	large & small footrope gear for Other flatfish[3/] & English sole	55,000 lb/ month		110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole.				110,000 lb/ 2 months
23	large & small footrope gear for Petrale sole	30,000 lb/ month						60,000 lb/ 2 months
24	selective flatfish trawl gear for Other flatfish[3/] & English sole	45,000 lb/ month		90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole.	90,000 lb/ 2 months, no more than 28,000 lb/ 2 months of which may be petrale sole.			90,000 lb/ 2 months
25	selective flatfish trawl gear for Petrale sole	12,500 lb/ month						25,000 lb/ 2 months
26	multiple bottom trawl gear [8/]	Other flatfish[3/] and English sole: 45,000 lb/ month Petrale sole: 12,500 lb/ month		90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole.	90,000 lb/ 2 months, no more than 28,000 lb/ 2 months of which may be petrale sole.			Other flatfish[3/] and English sole: 90,000 lb/ 2 months Petrale sole: 25,000 lb/ 2 months
27	Arrowtooth flounder							
28	large & small footrope gear	50,000 lb/ month		100,000 lb/ 2 months				
29	selective flatfish trawl gear	40,000 lb/ month		80,000 lb/ 2 months				
30	multiple bottom trawl gear [8/]	40,000 lb/ month		80,000 lb/ 2 months				
31	**Whiting**							
32	midwater trawl	Before the primary whiting season: CLOSED -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED						
33	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip -- During the primary season: 10,000 lb/trip -- After the primary whiting season: 10,000 lb/trip						
34	**Minor shelf rockfish[1/], Shortbelly, Widow & Yelloweye rockfish**							
35	midwater trawl for Widow rockfish	Before the primary whiting season: CLOSED -- During primary whiting season: In trips of at least 10,000 lb of whiting, combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED						
36	large & small footrope gear	150 lb/ month		300 lb/ 2 months				
37	selective flatfish trawl gear	300 lb/ month			1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
38	multiple bottom trawl gear [8/]	300 lb/ month			300 lb/ 2 months, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month

Table 2-6a. 2006 Trip limits for limited entry trawl gears north of 40°10' N latitude (continued).

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]: North of 40°10' N. lat.	75 fm - modified 200 fm [7/]		75 - 200 fm		100 - 200 fm	75 fm - 200 fm	75 fm - modified 200 fm [7/]
39	**Canary rockfish**							
40	large & small footrope gear	CLOSED						
41	selective flatfish trawl gear	100 lb/ month			300 lb/ month		100 lb/ month	
42	multiple bottom trawl gear [8/]	CLOSED						
43	**Yellowtail**							
44	midwater trawl	Before the primary whiting season: CLOSED -- During primary whiting season: In trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED						
45	large & small footrope gear	150 lb/ month		300 lb/ 2 months				
46	selective flatfish trawl gear	1,000 lb/ month		2,000 lb/ 2 months				
47	multiple bottom trawl gear [8/]	150 lb/ month		300 lb/ 2 months				
48	**Minor nearshore rockfish & Black rockfish**							
49	large & small footrope gear	CLOSED						
50	selective flatfish trawl gear	300 lb/ month						
51	multiple bottom trawl gear [8/]	CLOSED						
52	**Lingcod[4/]**							
53	large & small footrope gear	600 lb/ month		1,200 lb/ 2 months				
54	selective flatfish trawl gear							
55	multiple bottom trawl gear [8/]							
56	**Pacific cod**	Not limited		30,000 lb/ 2 months	70,000 lb/ 2 months			30,000 lb/ 2 months
57	**Spiny dogfish**	Not limited		200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
58	**Other Fish [5/]**	Not limited						

1/ Bocaccio, chilipepper and cowcod are included in the trip limits for minor shelf rockfish.
2/ Splitnose rockfish is included in the trip limits for minor slope rockfish.
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 200 fm" line is modified to exclude certain petrale sole areas from the RCA.
8/ If a vessel has both selective flatfish gear and large or small footrope gear on board during a cumulative limit period (either simultaneously or successively), the most restrictive cumulative limit for any gear on board during the cumulative limit period applies for the entire cumulative limit period.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-6b. 2006 Trip limits for limited entry trawl gears south of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:							
	40°10' - 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	38° - 34°27' N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	South of 34°27' N. lat.	75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands				75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands
	Small footrope gear is required shoreward of the RCA; all trawl gear (large footrope, midwater trawl, and small footrope gear) is permitted seaward of the RCA.							
	See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).							
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.							
1	**Minor slope rockfish[2/] & Darkblotched rockfish**							
2	40°10' - 38° N. lat.	4,000 lb/ month		8,000 lb/ 2 months				
3	South of 38° N. lat.	20,000 lb/ month		40,000 lb/ 2 months				
4	**Splitnose**							
5	40°10' - 38° N. lat.	4,000 lb/ month		8,000 lb/ 2 months				
6	South of 38° N. lat.	20,000 lb/ month		40,000 lb/ 2 months				
7	**DTS complex**							
8	Sablefish	8,500 lb/ month		17,000 lb/ 2 months				
9	Longspine thornyhead	9,500 lb / month		19,000 lb/ 2 months				
10	Shortspine thornyhead	2,450 lb/ month		4,900 lb/ 2 months				
11	Dover sole	25,000 lb/ month		50,000 lb/ 2 months	35,000 lb/ 2 months			
12	**Flatfish** (except Dover sole)							
13	Other flatfish[3/] & English sole							
14	40°10' - 38° N. lat.	55,000 lb/ month		Other flatfish, English sole & Petrale sole: 110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole.				110,000 lb/ 2 months
15	South of 38° N. lat.							
16	Petrale sole	30,000 lb/ month						60,000 lb/ 2 months

Table 2-6b. 2006 Trip limits for limited entry trawl gears south of 40°10' N latitude (continued).

		JAN	FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:							
	40°10' - 38° N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	38° - 34°27' N. lat.	75 fm - 150 fm		100 fm - 150 fm				75 fm - 150 fm
	South of 34°27' N. lat.	75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands		100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands				75 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands
17	Arrowtooth flounder							
18	40°10' - 38° N. lat.	5,000 lb/ month		10,000 lb/ 2 months				
19	South of 38° N. lat.							
20	**Whiting**							
21	midwater trawl	Before the primary whiting season: CLOSED -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED						
22	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip -- During the primary season: 10,000 lb/trip -- After the primary whiting season: 10,000 lb/trip						
23	**Minor shelf rockfish[1/], Chilipepper, Shortbelly, Widow, & Yelloweye rockfish**							
24	large footrope or midwater trawl for Minor shelf rockfish & Shortbelly	300 lb/ month						
25	large footrope or midwater trawl for Chilipepper	1,000 lb/ months		2,000 lb/ 2 months	12,000 lb/ 2 months		8,000 lb/ 2 months	
26	large footrope or midwater trawl for Widow & Yelloweye	CLOSED						
27	small footrope trawl for Minor Shelf, Shortbelly, Widow & Yelloweye	300 lb/ month			300 lb/ month			
28	small footrope trawl for Chilipepper				500 lb/ month			
29	**Bocaccio**							
30	large footrope or midwater trawl	150 lb/ month		300 lb/ 2 months				
31	small footrope trawl	CLOSED						
32	**Canary rockfish**							
33	large footrope or midwater trawl	CLOSED						
34	small footrope trawl	100 lb/ month			300 lb/ month		100 lb/ month	
35	**Cowcod**	CLOSED						
36	**Minor nearshore rockfish & Black rockfish**							
37	large footrope or midwater trawl	CLOSED						
38	small footrope trawl	300 lb/ month						
39	**Lingcod[4/]**							
40	large footrope or midwater trawl	600 lb/ month		1,200 lb/ 2 months				
41	small footrope trawl							
42	**Pacific cod**	Not limited		30,000 lb/ 2 months	70,000 lb/ 2 months			30,000 lb/ 2 months
43	**Spiny dogfish**	Not limited		200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
44	**Other Fish[5/] & Cabezon**	Not limited						

1/ Yellowtail is included in the trip limits for minor shelf rockfish.
2/ POP is included in the trip limits for minor slope rockfish
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ Other fish are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 200 fm" line is modified to exclude certain petrale sole areas from the RCA.

of 35,000 mt, and then setting aside 1,800 mt for incidental bycatch in non-whiting fisheries and 200 mt for research catch. The resulting yield is then allocated between factory trawlers or catcher-processors (34%), vessels delivering to at-sea processors or motherships (24%), and vessels delivering to shore-based processing plants (42%). Table 2-7 indicates the set asides and allocations for 2006 fisheries.

Table 2-7. Pacific whiting set-asides and allocations by fishing sector specified in 2006.

Sector	Set-aside or allocation (mt)
Tribal whiting	35,000
Non-whiting fisheries	1,800
Research	200
Catcher-processors	78,903
Motherships	55,697
Shore-based whiting	97,469
Total	269,069

The GMT recommended exploring overfished species' bycatch implications in the Pacific whiting fishery using a 4-year weighted average bycatch model (the years 2001-2004 were used to project 2005 impacts and the years 2002-2005 were used to project 2006 impacts- see chapter 4 for more details). The rates used to project 2006 whiting fishery impacts were applied to the 2006 OY under this alternative (these same rates are used to explore bycatch implications in 2007 and 2008 Pacific whiting fisheries- see below). The Council again specified bycatch caps for stocks that could potentially constrain opportunities in the Pacific whiting and other West Coast fishing sectors in 2006. The two overfished West Coast groundfish stocks that are incidentally caught in the whiting-directed trawl fishery and for which bycatch caps have been specified in 2006 regulations are canary and widow rockfish. The Council and NMFS decided to set aside 4.7 mt of canary rockfish and 200 mt of widow rockfish for the 2006 non-tribal whiting-directed fisheries. The non-tribal sectors of the whiting fishery would close prior to reaching their whiting allocations if these caps were reached inseason. However, the Council reserved the ability to change these caps inseason if there was unused yield available and it was needed to keep whiting fisheries open.

2.2.3.1.2 Limited Entry Fixed Gear Fisheries

Limited entry fixed gear trip limits and the nontrawl RCA configuration as of May 2006 describe the No Action Alternative and are shown in Tables 2-8a (north of 40°10' N latitude) and 2-8b (south of 40°10' N latitude). Under the No Action Alternative, the nontrawl RCA is defined by management lines specified with waypoints at roughly 30 fm to 100 fm in waters off northern California (north of 40°10' N latitude) and Oregon; and zero fm to 100 fm in waters off Washington. The nontrawl RCA south of 40°10' N latitude and north of Point Conception at 34°27' N latitude under the No Action Alternative is defined by management lines specified with waypoints at roughly 30 fm to 150 fm during periods 1, 2, 5, and 6 and 20 fm to 150 fm during periods 3 and 4. There is an additional closure between zero fm and 10 fm around the Farallon Islands to reduce impacts on shallow nearshore rockfish in that area. The nontrawl RCA south of Point Conception is defined by management lines specified with waypoints at roughly 60 fm to 150 fm. This more liberal RCA can be accommodated by the minimal occurrence of canary rockfish in the Southern California Bight. Canary and yelloweye rockfish are not allowed to be landed in the limited entry fixed gear fishery under the No Action Alternative.

The primary sablefish fishery, open to limited entry fixed gear permit holders that have a sablefish endorsement, runs from April 1 through October 31. Permit stacking is allowed in this fishery, where

Table 2-8a. 2006 Trip limits for limited entry fixed gears north of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
	See § 660.370 and § 660.382 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish [2/] & Darkblotched rockfish**	4,000 lb/ 2 months					
2	**Pacific ocean perch**	1,800 lb/ 2 months					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months					
4	**Longspine thornyhead**	10,000 lb/ 2 months					
5	**Shortspine thornyhead**	2,000 lb/ 2 months					
6	**Dover sole**	5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.		5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.			
7	**Arrowtooth flounder**						
8	**Petrale sole**						
9	**English sole**						
10	**Other flatfish[1/]**						
11	**Whiting**	10,000 lb/ trip					
12	**Minor shelf rockfish[2/], Shortbelly, Widow, & Yellowtail rockfish**	200 lb/ month					
13	**Canary rockfish**	CLOSED					
14	**Yelloweye rockfish**	CLOSED					
15	**Minor nearshore rockfish & Black rockfish**						
16	North of 42° N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
17	42° - 40°10' N. lat.	6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
18	**Lingcod[4/]**	CLOSED		800 lb/ 2 months			CLOSED
19	**Pacific cod**	Not limited	1,000 lb/ 2 months				
20	**Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
21	**Other fish[5/]**	Not limited					

1/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
2/ Bocaccio, chilipepper and cowcod are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.
3/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-8b. 2006 Trip limits for limited entry fixed gears south of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
	See § 660.370 and § 660.382 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[2/] & Darkblotched rockfish**	40,000 lb/ 2 months					
2	**Splitnose**	40,000 lb/ 2 months					
3	**Sablefish**						
4	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months					
5	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
6	**Longspine thornyhead**	10,000 lb / 2 months					
7	**Shortspine thornyhead**	2,000 lb/ 2 months					
8	**Dover sole**	5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.		5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.			
9	**Arrowtooth flounder**						
10	**Petrale sole**						
11	**English sole**						
12	**Other flatfish[1/]**						
13	**Whiting**	10,000 lb/ trip					
14	**Minor shelf rockfish[2/], Shortbelly, & Widow rockfish**						
15	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED	200 lb/ 2 months		300 lb/ 2 months	
16	South of 34°27' N. lat.	3,000 lb/ 2 months					
17	**Chilipepper rockfish**	2,000 lb/ 2 months, this opportunity only available seaward of the nontrawl RCA					
18	**Canary rockfish**	CLOSED					
19	**Yelloweye rockfish**	CLOSED					
20	**Cowcod**	CLOSED					
21	**Bocaccio**						
22	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED	100 lb/ 2 months	300 lb/ 2 months		
23	South of 34°27' N. lat.	300 lb/ 2 months		300 lb/ 2 months			
24	**Minor nearshore rockfish & Black rockfish**						
25	Shallow nearshore	300 lb/ 2 months	CLOSED	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
26	Deeper nearshore						
27	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED	500 lb/ 2 months		400 lb/ 2 months	500 lb/ 2 months
28	South of 34°27' N. lat.			600 lb/ 2 months			400 lb/ 2 months
29	California scorpionfish	300 lb/ 2 months	CLOSED	300 lb/ 2 months	400 lb/ 2 months		300 lb/ 2 months

Table 2-8b. 2006 Trip limits for limited entry fixed gears south of 40°10' N latitude (continued).

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]**:**						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
30	**Lingcod**[3/]	CLOSED		800 lb/ 2 months			CLOSED
31	**Pacific cod**	Not limited	1,000 lb/ 2 months				
32	**Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
33	**Other fish**[4/] **& Cabezon**	Not limited					

1/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
2/ POP is included in the trip limits for minor slope rockfish. Yellowtail is included in the trip limits for minor shelf rockfish.
3/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
4/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
5/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

more than one and up to three permits may be used on a single vessel during the primary sablefish season. Limited entry permits with sablefish endorsements are assigned to one of three different cumulative trip limit tiers, based on the qualifying catch history of the permit. The 2006 sablefish limits are as follows: tier 1 = 62,700 lb, tier 2 = 28,500 lb, and tier 3 = 16,300 lb.

The Council and NMFS adopted a similar change in cumulative trip limits for Pacific cod and spiny dogfish for limited entry fixed gear fisheries as they did for limited entry trawl fisheries beginning in March 2006 (period 2). While the spiny dogfish limits for limited entry fixed gear fisheries were the same for spiny dogfish as in the limited entry trawl fishery, the Pacific cod limits were much lower since Pacific cod are less frequently caught by fixed gears. Tables 2.7a and 2.7b depict the 2006 Pacific cod and spiny dogfish trip limits for limited entry fixed gear fisheries.

Limited entry fixed gears are not allowed to be fished in the Cowcod Conservation Areas (Figure 2-3) under the No Action Alternative, except for some nearshore commercial fishing opportunities described in section 2.2.3.1.4.

2.2.3.1.3 Open Access Fisheries

Open access fisheries are those West Coast commercial fisheries comprised of vessels without a federal limited entry trawl or limited entry fixed gear permit that catch groundfish either as target species (directed groundfish fisheries) or incidentally while targeting non-groundfish species (incidental groundfish fisheries).

Open access gears that fish the bottom and any of the gears used in the directed groundfish fisheries are not allowed to be fished in the Cowcod Conservation Areas (Figure 2-3) under the No Action Alternative, except for some nearshore commercial fishing opportunities described in section 2.2.3.1.4.

Directed Groundfish Fisheries

There are directed groundfish fisheries that target nearshore species (see the following section 2.2.3.1.4) and those operating on the shelf and slope primarily targeting sablefish (daily-trip-limit fishery) and slope rockfish species. This section describes the No Action management measures associated with the latter category of open access vessels targeting groundfish offshore in federal waters.

Open access trip limits and estimated impacts of 2006 management measures as of May 2006 describe the No Action Alternative and are shown in Tables 2-9a (north of 40°10' N latitude) and 2-9b (south of 40°10' N latitude). The same nontrawl RCA described for limited entry fixed gears under the No Action

Table 2-9a. 2006 trip limits for open access gears north of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
	See § 660.370 and § 660.383 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[1/] & Darkblotched rockfish**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months		300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 3,000 lb/ 2 months			
4	**Thornyheads**	CLOSED					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weights per line are not subject to the RCAs.		3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.			
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**English sole**						
9	**Other flatfish[2/]**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish[1/], Shortbelly, Widow, & Yellowtail rockfish**	200 lb/ month					
12	**Canary rockfish**	CLOSED					
13	**Yelloweye rockfish**	CLOSED					
14	**Minor nearshore rockfish & Black rockfish**						
15	North of 42° N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
16	42° - 40°10' N. lat.	6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
17	**Lingcod[4/]**	CLOSED		300 lb/ month			CLOSED
18	**Pacific cod**	Not limited	1,000 lb/ 2 months				
19	**Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
20	**Other Fish[5/]**	Not limited					

Table 2-9a. 2006 trip limits for open access gears north of 40°10' N latitude (continued).

21	**PINK SHRIMP NON-GROUNDFISH TRAWL** *(not subject to RCAs)*	
22	North	**Effective April 1 - October 31:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.
23	**SALMON TROLL**	
24	North	Salmon trollers may retain and land up to 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.

1/ Bocaccio, chilipepper and cowcod rockfishes are included in the trip limits for minor shelf rockfish.
Splitnose rockfish is included in the trip limits for minor slope rockfish.
2/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
3/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.
4/ The size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 2-9b. 2006 trip limits for open access gears south of 40°10' N latitude.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
	See § 660.370 and § 660.383 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[1/] & Darkblotched rockfish**						
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3	South of 38° N. lat.	10,000 lb/ 2 months					
4	**Splitnose**	200 lb/ month					
5	**Sablefish**						
6	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months		300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 3,000 lb/ 2 months			
7	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
8	**Thornyheads**						
9	40°10' - 34°27' N. lat.	CLOSED					
10	South of 34°27' N. lat.	50 lb/ day, no more than 1,000 lb/ 2 months					
11	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to 1 lb (0.45 kg) of weight per line are not subject to the RCAs.		3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.			
12	**Arrowtooth flounder**						
13	**Petrale sole**						
14	**English sole**						
15	**Other flatfish[2/]**						
16	**Whiting**	300 lb/ month					
17	**Minor shelf rockfish[1/], Shortbelly, Widow & Chilipepper rockfish**						
18	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED	200 lb/ 2 months		300 lb/ 2 months	
19	South of 34°27' N. lat.	750 lb/ 2 months					
20	**Canary rockfish**	CLOSED					
21	**Yelloweye rockfish**	CLOSED					
22	**Cowcod**	CLOSED					
23	**Bocaccio**						
24	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED	100 lb/ 2 months		200 lb/ 2 months	
25	South of 34°27' N. lat.	100 lb/ 2 months		100 lb/ 2 months			

Table 2-9b. 2006 trip limits for open access gears south of 40°10' N latitude (continued).

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]: 40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
26	**Minor nearshore rockfish & Black rockfish**						
27	Shallow nearshore	300 lb/ 2 months	CLOSED	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
28	Deeper nearshore						
29	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED	500 lb/ 2 months		400 lb/ 2 months	500 lb/ 2 months
30	South of 34°27' N. lat.			600 lb/ 2 months			400 lb/ 2 months
31	California scorpionfish	300 lb/ 2 months	CLOSED	300 lb/ 2 months	400 lb/ 2 months		300 lb/ 2 months
32	**Lingcod[3/]**	CLOSED		300 lb/ month, when nearshore open			CLOSED
33	**Pacific cod**	Not limited	1,000 lb/ 2 months				
34	**Spiny dogfish**	Not limited	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
35	**Other Fish[4/] & Cabezon**	Not limited					

Alternative above would also apply for those open access fisheries not exempt from the RCA restrictions.

In 2005, a factory longliner from Alaska announced plans to target spiny dogfish in West Coast waters under the open access limits, which were unlimited for species such as spiny dogfish in the Other Fish complex. Fixed gear fisheries targeting spiny dogfish are known to incidentally catch canary and yelloweye rockfish. This unanticipated entrant to the open access fishery was of particular concern since the volume of dogfish that could be landed could incur a significant bycatch of canary and yelloweye rockfish, especially for vessel operators unfamiliar with the West Coast distribution of these species and the techniques employed to avoid them. Therefore, on May 2, 2005, NMFS implemented an emergency rule to specify canary and yelloweye rockfish bycatch caps for the directed open access fishery of 1.0 mt and 0.6 mt, respectively. All directed open access fisheries (those fisheries targeting groundfish species) would close if any of these caps were projected to be attained early in the fishing season. The Council and NMFS increased these caps to 3.0 mt for each of the species later in the year (implemented on July 1) based on increased availability of canary and yelloweye rockfish. While the factory longliner never did implement plans to target spiny dogfish on the West Coast, the Council and NMFS did by decide to change the spiny dogfish limits for limited entry and open access fisheries from unlimited to specified bimonthly trip limits for the open access fishery beginning in March 2006 (Tables 2-9a and 2-9b). While this action did not wholly address the particular vulnerability of lack of effort controls in the open access fishery, it did address bycatch concerns for targeting spiny dogfish in open access (and limited entry) fisheries.

The same 2006 change in Pacific cod management measures adopted for the limited entry fixed gear fishery was made for open access fisheries by adopting new bimonthly trip limits for this stock in March 2006 (Tables 2-9a and 2-9b).

The sablefish daily trip limit (DTL) fishery north of 36° N latitude has caught less than their allocation in recent years. In 2005, the DTL limits for January-September were 300 pounds per day, or one landing per week up to 900 pounds, not to exceed 3,600 pounds per two months. These DTL limits were increased for October through December to 500 pounds per day, or one landing per week up to

1,500 pounds, not to exceed 9,000 pounds per two months. The Council recommended maintaining the previously scheduled daily limit of 300 pounds per day, raising the weekly limit to 1,000 pounds, and raising the two month limit to 5,000 pounds for December 2005. The Council considered a more liberal increase in daily and weekly DTL limits, but was concerned with the inability to control effort in this fishery and therefore recommended a cautious approach to liberalizing this fishery. In April 2006, the Council addressed an increased interest in the DTL sablefish fishery and was especially concerned given the reduced salmon fishing opportunities available. The concern was the open access sablefish quota may be attained early in 2006 without an effective open access effort control mechanism. Therefore, the Council adopted a decreased DTL bimonthly limit for sablefish of 3,000 pounds and tasked the GMT to review effort shifts into this fishery and consider increased DTL limits in June.

Incidental Groundfish Fisheries

West Coast commercial fishing vessels targeting non-groundfish species, but landing groundfish under open access limits are included in the category of incidental open access fisheries. In some cases, such as the ridgeback prawn trawl fishery south of 34°27' N latitude, the northern pink shrimp fishery, and the salmon troll fishery, there are specific exemptions from non-trawl RCA restrictions while landing some groundfish species.

Under the No Action Alternative, the ridgeback prawn trawl fishery south of 34°27' N latitude is allowed to operate out to the 100 fm line regardless of the non-trawl RCA configuration south of Pt. Conception. This exemption is allowed because ridgeback prawn trawling occurs over soft mud substrates where depleted rockfish species do not occur and ridgeback prawns are found largely adjacent to the 100 fm isobath in this area. The pink shrimp trawl fishery is not restricted by an RCA, but approved bycatch reduction devices or fish excluders in shrimp trawls are mandated to minimize incidental groundfish bycatch. The salmon troll fishery is exempted from RCA restrictions, but groundfish species, including lingcod, are not allowed to be retained while fishing in the non-trawl RCA. The only exemption to this regulation under the No Action Alternative is an incidental landing allowance of up to 1 lb of yellowtail rockfish per 2 lbs of salmon landed with a cumulative monthly landing limit of 200 lbs of yellowtail rockfish, both within and outside the RCA. Otherwise, non-trawl RCA restrictions apply to incidental groundfish fisheries if groundfish are to be legally retained and landed under the open access limits.

2.2.3.1.4 Nearshore Commercial Fisheries

The majority of vessels participating in nearshore commercial fisheries do not hold federal limited entry permits, and the most common gear used is jig gear. However, some vessels use longline gear to target nearshore species and, in rare instances, pots or traps are used in the nearshore fishery. California and Oregon limit entry to the nearshore groundfish fishery by requiring a state limited entry permit to take commercial quantities of nearshore groundfish species (see sections 2.1.4.1 and 2.1.4.2 for the lists of nearshore rockfish species targeted in nearshore commercial fisheries north and south of 40°10' N latitude). Washington does not allow a nearshore commercial fishery. More conservative state harvest targets or guidelines than those specified in federal regulations exist for most nearshore species and state trip limits supersede federal limits in these cases. State trip limits are designed to stay within nearshore species harvest caps (Tables 2-10 and 2-11) while providing a year-round opportunity, if possible. Federal management measures for West Coast nearshore commercial groundfish fisheries are typically stratified north and south of 40°10' N latitude.

Table 2-10. Nearshore groundfish species' harvest limits, including harvest targets, OYs, and harvest guidelines by West Coast region, 2002-2006.

	2002			2003		
Species Group	Recreational	Commercial	Total	Recreational	Commercial	Total
	North of Cape Mendocino					
Minor Nearshore Rockfish North[1,4]	663	**324**	**987**	740	**188**	**928**
	Oregon/California Border to Cape Mendocino					
Black and Blue Rockfish	-----	-----	-----	36.8	58.5	95.3
Other Nearshore Rockfish	-----	-----	-----	3.7	10.1	13.8
Total Minor NS RF	-----	-----	-----	40.5	68.6	109
	Cape Mendocino to California/Mexico Border					
Shallow Nearshore Rockfish South	-----	-----	-----	66	38.8	105
Deeper Nearshore Rockfish South[3]	-----	-----	-----	303.1	48	351
California Scorpionfish	-----	-----	-----	63.9	21	84.9
Total Minor Nearshore RF South	532	**130**	**662**	433	**108**	**541**

	2004			2005			2006		
Species Group	Recreational	Commercial	Total	Recreational	Commercial	Total	Recreational	Commercial	Total
	North of Cape Mendocino								
Minor Nearshore Rockfish North	68	**54**	**122**	68	**54**	**122**	68	**54**	**122**
	Statewide								
Black Rockfish[5]	186	140	**326**	175	141	**316**	170	139	**309**
	Oregon/California Border to Cape Mendocino								
Black Rockfish[5]	72	123	194	74	116	190	72	113	185
Other Nearshore Rockfish North	6.6	14.8	21.4	6.6	14.8	21.4	6.6	14.8	21.4
	Cape Mendocino to California/Mexico Border								
Minor Nearshore Rockfish South[2]	375	**97**	**494**	383	**97**	**494**	383	**97**	**494**
Shallow Nearshore Rockfish South	66	38.8	105	-----	-----	-----	-----	-----	-----
Deeper Nearshore Rockfish South[3]	245.1	37.2	282	-----	-----	-----	-----	-----	-----
California Scorpionfish	63.9	21	84.9	-----	-----	-----	-----	-----	-----
Black Rockfish[5]	114	17	131	101	25	126	99	25	124

1/ Non-bolded numbers are harvest targets; bolded numbers are either OYs or harvest guidelines

2/ Minor Nearshore Rockfish includes a reserve of 22 mt in 2004, 14 mt in 2005, and 14 mt in 2006; 2004 OY corrected from 615 mt (in 2004 Fed. Reg.) to 494 mt so does not include the 121 mt that was removed from this group in 2003 when the OY was calculated as 50% of recent landings; the confusion exists because the 121 mt was kept as a reserve in the overall Minor Rockfish OY and was accidentally added back into the NS RF OY in 2004.

3/ Starting in 2004, Deeper Nearshore does not include black rockfish.

4/ Black Rockfish north of 40º 30' to 43º 00' had an ABC of 500 mt in 2003.

5/ The black rockfish OY south of 46º16' N Lat. is subdivided with separate HGs being set for the area north (58 percent of OY) and south (42 percent of OY) of 42º N Lat. For the area south of 42º N Lat., 60 percent of the HG is to be applied to the area north of 40º10' N Lat. and 40 percent applied to the area south of 40º10' N Lat.

Nearshore Commercial Fisheries North of 40°10' N latitude

There are nearshore commercial fisheries north of 40°10' N latitude to the Oregon-Washington border at 46°10' N latitude; Washington does not allow nearshore commercial fisheries in their state waters. A depiction of the season duration for northern nearshore commercial fisheries and predicted black, canary, and yelloweye rockfish impacts under the No Action and action alternatives is provided in Table 2-12a.

Table 2-11. State and federal harvest guidelines specified for state-managed groundfish fisheries in California in 2006.

Species or Species complex	Sector	Harvest guideline in mt (or pounds)
Canary Rockfish	Rec.	9.3
Yelloweye Rockfish	Rec.	3.7
Black Rockfish	NS Comm.	139
	Rec.	170
	Total	309
Minor Nearshore Rockfish	NS Comm.	97
	Rec.	383
	Total	480
Cabezon	NS Comm.	42.1 (92,800)
	Rec.	26.9 (59,300)
	Total	69 (152,100)
Greenlings	NS Comm.	1.5 (3,400)
	Rec.	15.5 (34,200)
	Total	17.1 (37,600)
Lingcod	Rec.	422

Table 2-12a. Season structure and expected yelloweye rockfish and canary rockfish impacts under the 2007-2008 No Action and action alternatives for nearshore commercial fisheries north of 40°10' N latitude.

Alternative	Season Duration	Black Rockfish Reduction (%)	Shoreward RCA (fm)	Estimated Impact (mt) to Yelloweye Rockfish	Estimated Impact (mt) to Canary Rockfish
No Action	12 month season	0	30	2.1	1.7
1	<6 month season	60	20	0.8	0.7
2	12 month season	10	20	1.3	1.2
3a	12 month season	0	20	1.4	1.3
3b	12 month season	0	30	2.1	1.7

Under the No Action Alternative, the nontrawl RCA is defined by management lines specified with waypoints at roughly 30 fm to 100 fm in waters off northern California (north of 40°10' N latitude) and Oregon; and zero fm to 100 fm in waters off Washington. In Oregon, those limited entry permit holders may land commercial quantities of black and blue rockfish under state trip limits, with an additional 15 lbs per day of other nearshore groundfish species. Vessels that also have a nearshore endorsement, in addition to the black/blue limited entry permit may land commercial quantities of other nearshore rockfish (which includes two rockfish with a federal designation as shelf rockfish - tiger and vermilion rockfish), cabezon, and greenling under state trip limits. For vessels that do not hold a state permit or endorsement, an incidental landing limit of no more than 15 pounds per day of any combination of black rockfish, blue rockfish, and/or other nearshore fish is allowed, with a few exceptions. Salmon trollers with a valid troll permit may land 100 pounds of black rockfish, blue rockfish, or a combination thereof in the same landing in which a salmon is landed. These rockfish may only be landed dead. If the cumulative landing of black and blue rockfish combined in the salmon troll fishery reaches 3,000 pounds in any calendar year, then each salmon troll vessel is limited to 15 pounds of black rockfish, blue rockfish, or a combination thereof per troll landing for the remaining calendar year. Trawlers may land up to 1,000 pounds of black rockfish, blue rockfish, or a combination thereof per calendar year and these fish must be 25 percent or less of the total poundage of each landing and must be landed dead.

The 2006 federal trip limit for nearshore species north of 40°10' N latitude to 42° N latitude is 6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish. The 2006 federal trip limit for nearshore species north of 42° N latitude is 5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish. This listed limit has been superseded by the more conservative Oregon state limits for the last several years.

Nearshore Commercial Fisheries South of 40°10' N latitude

In California, those limited entry permit holders who also have either a shallow nearshore fishery or deeper nearshore fishery permit administered by CDFG may land minor nearshore rockfish from either the shallow nearshore or deeper nearshore complexes. Trip limits for shallow nearshore rockfish, deeper nearshore rockfish, and California scorpionfish vary by period (Table 2-8b).

A depiction of the season duration for southern nearshore commercial fisheries and predicted nearshore rockfish, canary, and yelloweye rockfish impacts under the No Action and action alternatives is provided in Table 2-12b for the area 40°10’ N. latitude to 34°27’ N. latitude.

Table 2-12b. Season structure and expected yelloweye rockfish and canary rockfish impacts under the 2007-2008 No Action and action alternatives for nearshore commercial fisheries south of 40°10' N latitude to 34°27’ N. latitude .

Alternative	Season Duration	Nearshore Rockfish Reduction (%)	Shoreward RCA (fm)	Estimated Impact (mt) to Yelloweye Rockfish	Estimated Impact (mt) to Canary Rockfish
No Action	10 month season	0	30 (Jan-Apr, Sep-Dec) 20 (May-Aug)	0.0	0.33
1	8 month season	15	20	0.0	0.26
2	10 month season	5	20	0.0	0.30
3a	10 month season	5	30	0.0	0.31
3b	10 month season	0	30	0.0	0.56

Under the No Action Alternative, the nontrawl RCA south of 40°10' N latitude and north of Point Conception at 34°27' N latitude is defined by management lines specified with waypoints at roughly 30 fm to 150 fm during periods 1, 2, 5, and 6 and at 20 fm to 150 fm during periods 3 and 4. There is an additional closure between zero fm and 10 fm around the Farallon Islands to reduce impacts on shallow nearshore rockfish in that area. The nontrawl RCA south of Point Conception is defined by management lines specified with waypoints at roughly 60 fm to 150 fm. This more liberal RCA can be accommodated by the minimal occurrence of canary rockfish in the Southern California Bight. Status quo management is proposed south of Point Conception under action alternatives 2 and 3 due to the low incidence rate of overfished species; a nontrawl RCA line of 40 fm is proposed under action alternative 1 due to impacts to bocaccio rockfish. Canary and yelloweye rockfish are not allowed to be landed in the fixed gear fisheries, including those targeting nearshore groundfish species, under the No Action Alternative.

Trip limits for shallow nearshore rockfish, deeper nearshore rockfish, and California scorpionfish vary by period (Table 2-8b). However, period 2 is closed for these species north and south of Point Conception, and shelf rockfish is closed at this time to minimize discard of nearshore species during the closed period. There is also a small and variable trip limit for bocaccio during the open nearshore periods to allow some incidental bycatch to be landed rather than discarded dead at sea. Species' harvest guidelines for California nearshore commercial fisheries are depicted in Table 2-11.

There is some nearshore commercial fishing allowed in the Cowcod Conservation Areas (Figure 2-3) in depths shallower than 20 fm under the No Action Alternative. Only southern minor nearshore rockfish, (both shallow and deeper nearshore rockfish- see section 2.1.4.1 for the list of species in this complex), California scorpionfish, cabezon, greenlings, California sheephead, and ocean whitefish are allowed to be retained in depths <20 fm in the CCAs.

2.2.3.1.5 Tribal Fisheries

The Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) prosecuted their groundfish fisheries in 2005-2006 with the following allocations and trip limits. The 2006 sablefish allocation was 10% of the total catch OY (for the portion of the stock north of 36° N latitude) of 7,363 mt. This provided an allocation of 736.3 mt of sablefish, which is further reduced after deducting an assumed 2.3% discard mortality for a landed catch allocation of 719.4 mt. The tribal commercial harvest of black rockfish was managed with a harvest guideline of 20,000 lbs north of Cape Alava, Washington at 48°09'30" N latitude, and 10,000 lbs between Destruction Island, Washington at 47°40' N latitude and Leadbetter Point, Washington at 46°38'10" N latitude. There were no harvest restrictions on black rockfish between Cape Alava and Destruction Island. Thornyheads were subject to a 300 lb trip limit as were canary rockfish. Yelloweye rockfish were subject to a 100 lb trip limit. For yellowtail rockfish the entire Makah tribal fleet (the only tribal fleet that participated in a midwater fishery) was subject to a cumulative landing limit of 180,000 lbs/two months. Widow rockfish landings were limited to 10% of the weight of yellowtail rockfish landed in any two-month period. These midwater landing limits were subject to inseason adjustments to minimize the take of canary and widow rockfish. Other rockfish, including species in the minor nearshore, minor shelf, and minor slope rockfish complexes were subject to either a 300 lb trip limit per species or complex, or to the non-tribal limited entry trip limit for those species if those limits were less restrictive. Rockfish taken during the open competition tribal commercial fisheries for Pacific halibut were not subject to trip limits. A full rockfish retention program, as well as a tribal observer program, was in place to provide catch accountability. Lingcod were subject to a 600 pound per day and 1,800 pound per week limit for all tribal fisheries except for the treaty troll fishery which was limited to 1,000 pounds per day and 4,000 pounds per week. A petrale sole trip limit of 50,000 lbs/two months for the Makah bottom trawl fleet was specified for the entire year. Trip limits for Pacific cod, English sole, rex sole, arrowtooth flounder, and other flatfish in the tribal bottom trawl fishery were the same as for non-tribal limited entry trawl fishery at the start of the season (Table 2-6a) using the same Council-approved gear. The tribal plan was not to reduce these limits inseason because of the low expected catch unless catch statistics indicated that the tribes would attain more than half the harvest of these species in their usual and accustomed (U and A) fishing areas. The tribal allocation of Pacific whiting in 2006 was 35,000 mt based on the sliding scale allocation formula that specifies the tribal whiting OY based on the total U.S. whiting OY (Table 2-7). The Makah tribe was the only one of the four tribes prosecuting a whiting-directed fishery in 2006, or proposing a whiting-directed fishery for 2007-2008.

2.2.3.1.6 Washington Recreational Fisheries

In 2005 and 2006, the Washington recreational fishery was open year round for groundfish except lingcod, which was open from the Saturday closest to March 15 through the Saturday closest to October 15 in Marine Areas 1-3 (from the Oregon/Washington border at 46º16' N latitude north to Cape Alava at 48º10' N latitude), and from April 15 through the Saturday closest to October 15 or October 15, whichever date is earlier, in Marine Area 4 (Cape Alava to the U.S./Canada border). In 2005, Marine

Areas 1-3 were open from March 12 through October 15, and Marine Area 4 was open from April 15 through October 15. In 2006, Marine Areas 1-3 are open from March 17 through October 14, and Marine Area 4 is open from April 15 through October 14.

Under the No Action Alternative, in 2007 and 2008, the following lingcod seasons would apply:

- Marine Areas 1-3: Open the Saturday closest to March 15 (which is March 17 in 2007 and March 15 in 2008) through the Saturday closest to October 15 (which is October 13 in 2007 and October 18 in 2008).

- Marine Area 4: Open April 15 through October 13 in 2007 and open April 15 through October 15 in 2008.

Washington has a recreational groundfish bag limit of 15 fish per day including rockfish and lingcod. Of the 15 recreational groundfish allowed to be landed per day, only 10 could be rockfish, with no retention of canary or yelloweye rockfish, and a sublimit of two lingcod with a 24-inch minimum size during the open lingcod season.

Recreational groundfish and recreational halibut fishing is prohibited within the "C-shaped" Yelloweye Rockfish Conservation Area (YRCA) (Figure 2-4). Coordinates defining the YRCA are provided in federal regulations at 50 CFR 660.390.

Washington and Oregon prosecuted their 2005 and 2006 recreational fisheries with shared harvest guidelines for canary rockfish, lingcod, and yelloweye rockfish. If the recreational harvest guideline for canary rockfish, lingcod, or yelloweye specified for the Washington/Oregon area was projected to be exceeded inseason, the Washington Department of Fish and Wildlife (WDFW) would consult with the Oregon Department of Fish and Wildlife (ODFW) and take action inseason to close all or portions of the recreational fishery deeper than 30 fm or adjust seasons, bag limits, or size limits, as needed. In 2005, the shared Washington and Oregon harvest guidelines for recreational fisheries were 8.5 mt, 234 mt, and 6.7 mt for canary rockfish, lingcod, and yelloweye rockfish, respectively. In 2006, the shared recreational harvest guidelines for canary and yelloweye remain the same, and lingcod is increased to 271 mt.

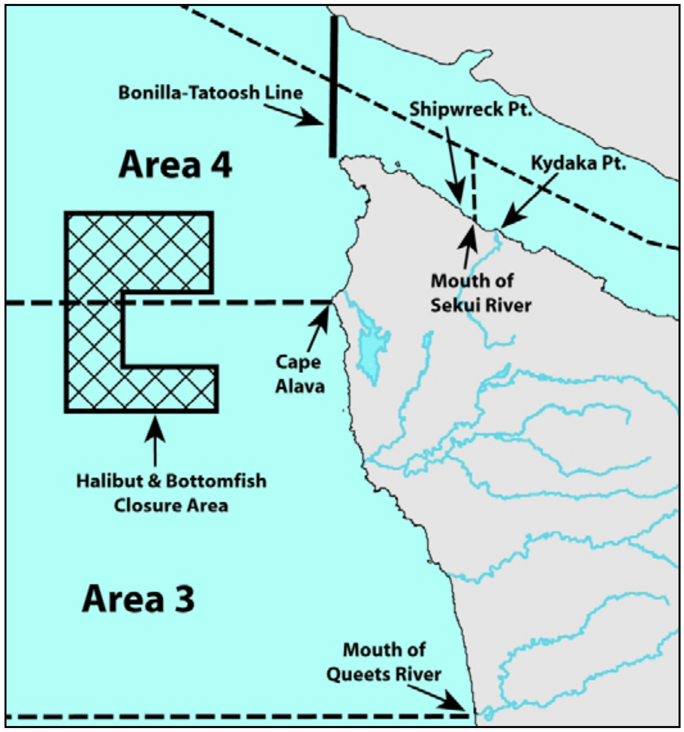

Figure 2-4. The current "C-shaped" Yelloweye Rockfish Conservation Area in waters off northern Washington where recreational groundfish and Pacific halibut fishing is prohibited.

The Washington portion of the shared canary rockfish harvest guideline was 1.7 mt and its portion of the shared yelloweye harvest guideline was 3.5 mt. These total catch amounts or harvest targets, if projected to be attained inseason by the Washington recreational fishery, were the triggers to consult with ODFW and consider an inseason action to slow or eliminate further canary or yelloweye rockfish mortality in this fishery. In 2005, WDFW projected that the yelloweye harvest target would be attained prematurely prompting such a consultation. That consultation indicated the shared yelloweye harvest guideline would be attained early, resulting in a WDFW action implemented on August 5 to close the recreational groundfish fishery outside of 30 fm in waters off Washington north of Leadbetter Pt. at 46º38'10" N latitude. The Council and NMFS adopted conforming federal regulations that were implemented on October 1, 2005.

New Washington recreational management measures were adopted for 2006 to avoid early canary and yelloweye rockfish harvest guideline attainment problems. To reduce the catch of yelloweye rockfish to stay within the Washington recreational harvest target, WDFW proposed, and the Council and NMFS adopted, the following modifications to the 2006 Washington recreational fishery:

- Prohibition of retention of rockfish and lingcod seaward of a line approximating the 20 fm depth contour from May 22, 2006, through September 30, 2006, in Marine Areas 3 and 4 (waters off Washington north of the Queets River at 47º31'42" N latitude where canary and yelloweye catches are highest) on days that halibut fishing is closed.

- Prohibition of retention of rockfish and lingcod seaward of a line approximating the 30 fm depth contour from March 18, 2006, through June 15, 2006, in Marine Area 2 (waters off Washington between Leadbetter Pt. and the Queets River).

Because the 20 fm line had not been previously analyzed, the following modification was made: where the line approximating the 20 fm depth contour extends beyond state waters and into the EEZ, the line will follow the seaward boundary of the state coastal waters.

Halibut fishery regulations for the 2006 Washington fishery became effective March 5, 2006. Therefore, it was necessary to modify the recreational groundfish regulations to conform to the new halibut regulations:

- South of Leadbetter Point to the Washington/Oregon border, when Pacific halibut are onboard the vessel, groundfish may not be taken and retained, possessed or landed, except sablefish and Pacific cod.

2.2.3.1.7 Oregon Recreational Fisheries

In 2005 (and 2006), the Oregon recreational groundfish fishery was (or is expected to be in 2006) open year round with no depth restrictions except during June through September when the fishery was open only inside 40 fm. Catches at the onset of 2005 were also managed using an 8 marine fish daily bag limit[10] including rockfish, greenling (*Hexagrammos* spp.), cabezon, and other groundfish species, but excluding salmon, lingcod, Pacific halibut, perch species, sturgeon, sanddabs, striped bass, tuna, and baitfish. There was no retention of canary and yelloweye rockfish. There was an additional daily bag limit of 25 Pacific sanddabs. Anglers could keep two lingcod with a 24 inch minimum size. Additionally, there was a minimum size limit of 16 inches for cabezon and a 10 inch minimum size limit for greenling species.

The Oregon recreational fishery was managed in 2005 and 2006 with harvest guidelines for black rockfish and widow rockfish, state harvest caps for other nearshore rockfish (including vermilion and tiger rockfish), greenlings, combined black and blue rockfish, and cabezon; and the shared Washington and Oregon harvest guidelines for canary rockfish, lingcod, and yelloweye rockfish discussed above in section 2.2.3.1.5 (Table 2-10). The state harvest caps were set using 2000 harvest as a proxy, and have only ocean boat landings applied against the harvest cap. The black rockfish harvest guideline was shared with Oregon nearshore commercial fisheries; the state allocated the guideline to these sectors as part of their authority. The Oregon black rockfish harvest guidelines for the recreational fishery was 332 mt in 2005 and 324.5 mt in 2006. The state harvest cap for cabezon was 15.8 mt in both 2005 and 2006. ODFW used their Oregon Recreational Boat Survey (ORBS) Program to monitor groundfish catches inseason. If the shared Washington and Oregon recreational harvest guideline for canary, yelloweye, or lingcod was projected to be exceeded, ODFW would consult with WDFW, and consider inseason action to close all or portions of the recreational fishery deeper than 20 fm or 30 fm or adjust seasons, bag limits, or size limits, as needed. Similar actions were considered to manage the black rockfish harvest guideline.

The Oregon Fish and Wildlife Commission (OFWC) also adopted 2005 regulations to prohibit retention of all marine fish (except sablefish, herring, anchovy, smelt, sardine, striped bass, hybrid bass, and offshore pelagic species) when Pacific halibut is retained by the vessel during open days for the all-depth sport fishery for Pacific halibut in the area between lines extending west of Oregon-Washington border and Humbug Mountain, Oregon at 42º40’30” N latitude to the EEZ boundary. This management

[10] The Council originally adopted a 10 marine fish daily bag limit for Oregon recreational fisheries. However, subsequent to the Council’s final decision on 2005 and 2006 management measures in June 2004, but prior to January 1, 2005, the Oregon Fish and Wildlife Commission adopted an 8 marine fish daily bag limit. The Council and NMFS adopted conforming federal regulations that were implemented on April 1, 2005.

measure adjustment was expected to provide additional harvest reduction of overfished species and other species with harvest guidelines such as black rockfish by discouraging secondary targeting of such species. This provision also applied during all-depth halibut days in June through September when groundfish retention was prohibited seaward of the RCA boundary approximating the 40 fm depth contour.

In July 2005, ODFW took action to reduce the marine fish daily bag limit from 8 marine fish to 5 marine fish for the remainder of the year to slow the harvest of black rockfish. ODFW took additional action in August 2005 to prohibit retention of cabezon in the recreational ocean boat fishery, due to attainment of the annual state harvest cap for cabezon, and again in October 2005 to close the ocean boat groundfish fishery in waters shoreward of the 40 fathom RCA line, and prohibit retention of black rockfish, as the black rockfish harvest guideline was projected to be attained.

In December 2005, the OFWC refined management measures for the 2006 Oregon recreational groundfish fishery, based on the angler effort patterns observed in 2005. Because there was a significant increase in angler effort targeting groundfish in 2005, due primarily to the poor salmon season in the waters off Oregon, the OFWC adopted a marine fish bag limit of 6 fish in aggregate. The reduced bag limit was necessary to keep the fishery within the 2006 Oregon harvest guideline for black rockfish and to provide a 12 month fishing season. All other management measures (i.e., length restrictions for lingcod, cabezon, and kelp greenling, >40 fm closure during June-September) remain as they were specified for 2005. If the federal and state harvest guidelines are approached in 2006, ODFW would take inseason actions similar in nature to those taken in 2005. Federal conforming regulations were implemented on April 1, 2006.

In 2005 and 2006, ODFW closed the high relief areas of Stonewall Banks to the Pacific halibut fishery during the all-depth Pacific halibut season. Targeting and retention of Pacific halibut was prohibited in the area, and vessels that have retained Pacific halibut while fishing another area, were then prohibited from targeting any species within the closed area. The coordinates for the Stonewall Banks closure implemented in the Pacific halibut fishery are as follows:

1	44º37.46 N latitude	124º24.92 W longitude
2	44º37.46 N latitude	124º23.63 W longitude
3	44º28.71 N latitude	124º21.80 W longitude
4	44º28.71 N latitude	124º24.10 W longitude
5	44º31.42 N latitude	124º25.47 W longitude

Returning to the first point (Figure 2-5).

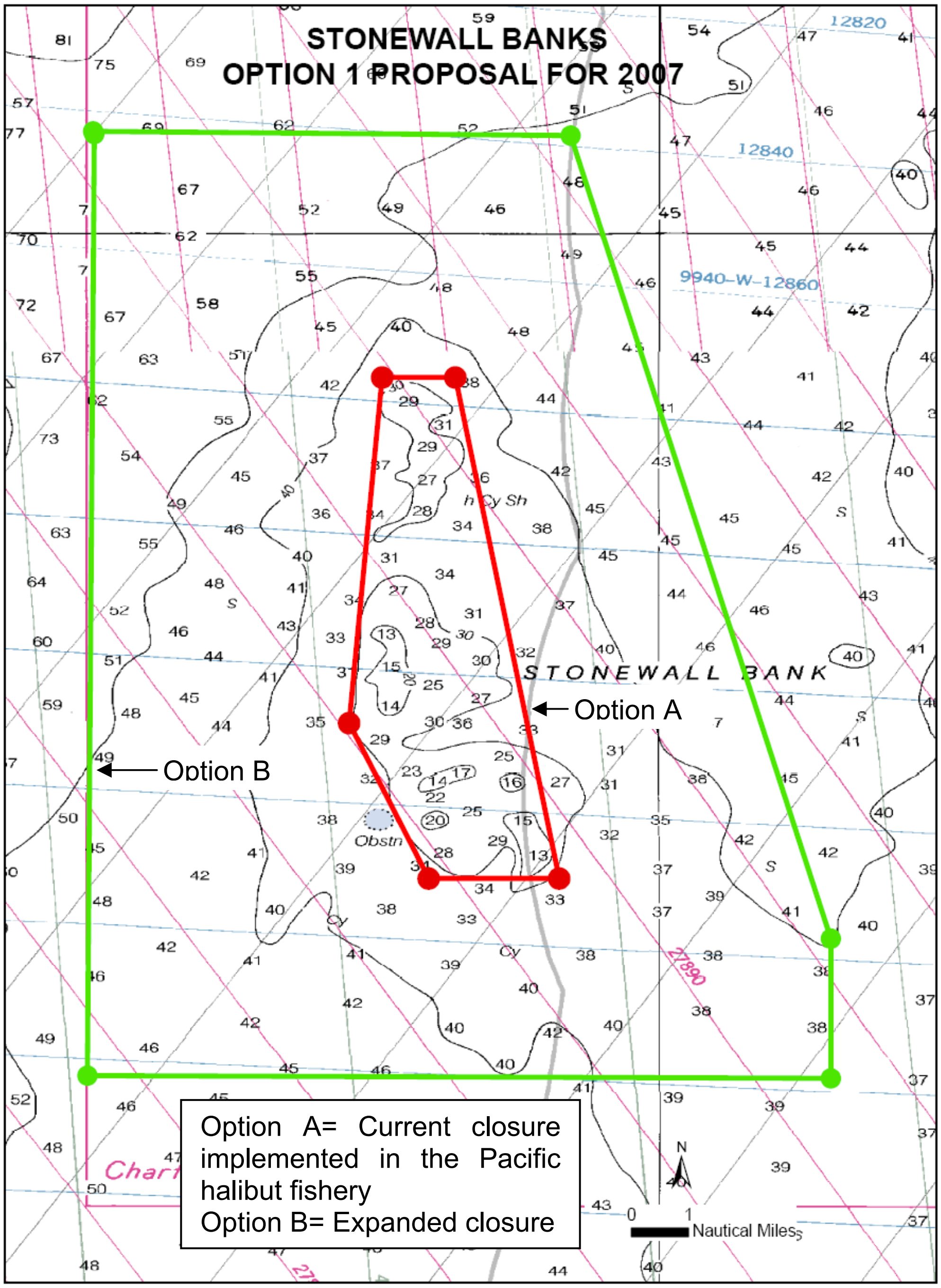

Figure 2-5. The current area closure on Stonewall Banks off the Oregon coast where Pacific halibut retention is prohibited during the all-depth fishery under the No Action Alternative (denoted Option A in figure) and the expanded closed area under Action Alternatives 1 and 3 (denoted Option B in figure).

Halibut regulations for the 2006 fishery became effective March 5, 2006. Therefore it was necessary to modify the recreational groundfish regulations to conform to the new halibut regulations:

- South of the Washington/Oregon border to Cape Falcon, OR, when Pacific halibut are onboard the vessel, groundfish may not be taken and retained, possessed or landed, except sablefish and Pacific cod.
- South of the Cape Falcon, OR, to Humbug Mountain, OR, when Pacific halibut are onboard the vessel, groundfish may not be taken and retained, possessed or landed, except sablefish, during days open to the Oregon Central Coast "all-depth" sport halibut fishery.

2.2.3.1.8 California Recreational Fisheries

For management of California's nearshore recreational groundfish fishery in 2005 and 2006, the California Fish and Game Department (CDFG) divided the coastline into five regional areas, although some regions had the same management measures and were therefore managed as a larger combined region. The five management areas, termed Rockfish/Lingcod Management Areas (RLMAs), are as follows: 1) Southern RLMA (U.S./Mexico Border to Point Conception at 34°27' N latitude), 2) Southern South-Central RLMA (Point Conception to Lopez Point at 36° N latitude), 3) Northern South-Central RLMA (Lopez Point to Pigeon Point at 37º11' N latitude), 4) Northern Central RLMA (Pigeon Point to Cape Mendocino at 40°10' N latitude), and 5) Northern RLMA (Cape Mendocino to the California/Oregon Border at 42° N latitude). The RLMAs between Lopez Point and Cape Mendocino were combined in 2005-2006 management with the intent to specify separate management measures in each of these RLMAs as needed to stay within state and federal harvest guidelines.

The Council and NMFS adopted 2005-2006 California recreational management measures as follows:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Lingcod size limit of 24 inches with a daily bag limit of two fish.
- Within a general bag limit of 20 fish, a combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish of which one can be a cabezon and one can be a greenling of the genus *Hexagrammos*[11].
- A two-fish bag limit for bocaccio in the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude) and a one-fish bag limit south of 40°10' N latitude to the U.S./Mexico border within the 10-fish RCG daily bag limit.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- All divers (use of boats is permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

[11] The cabezon daily bag sublimit was changed from three fish to one fish and the greenling daily bag sublimit was changed from 2 fish to 1 fish in a California Fish and Game Commission action in October 2004 subsequent to the Council's final decision in June 2004. The Council and NMFS adopted conforming federal regulations that were implemented on April 1, 2005.

The California recreational fishery was managed with federal and state harvest guideline for various groundfish species. Federal annual harvest guidelines were specified for canary rockfish (9.3 mt), yelloweye rockfish (3.7 mt), black rockfish (316 mt for recreational and nearshore commercial fisheries combined in 2005, of which 175 mt were allocated to the recreational fishery by CDFG; in 2006, the combined harvest guideline was 309 mt and the recreational harvest guideline was 170 mt), and lingcod (422 mt) (Table 2-11). State harvest guidelines were specified by CDFG for cabezon, greenlings, and minor nearshore rockfish (both shallow and deeper nearshore rockfish species; see section 2.1.4.1 for the list of species in these complexes). If the recreational harvest guideline for canary rockfish, yelloweye rockfish, or lingcod specified for California was projected to be exceeded, or if the state harvest guideline for black rockfish was projected to be exceeded when combining recreational harvest projections and annual commercial projections, CDFG and/or the Council and NMFS would take action to close all or part of the recreational fishery in all or part of the state regions in all or part of the remainder of the year. Any closure may pertain to closure of specific groundfish species or specific depths in different regions to achieve catch limitation. In the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude), CDFG would take action to close all or part of the recreational fishery deeper than the 30 fm management line if the canary or yelloweye rockfish harvest guideline was attained early in the season.

The 2005 and 2006 adopted management measures included depth bands where fishing for rockfish and associated species was allowed only between 20 and 40 fm (Southern South-Central RLMA) or 30 to 60 fm (Southern RLMA). California took inseason action in 2005 to remove the shoreward boundaries of these depth bands and allow boat-based fishing inside the seaward boundaries originally adopted in the Southern and Southern South-Central RLMAs. These actions were initiated to address concerns related to the ability to enforce fishing restrictions shoreward of adopted depth bands. In addition, final 2004 recreational CRFS projections of impacts showed that additional opportunity could be allowed shoreward of the adopted boundaries, as well as in additional months in the North, North-Central and Northern South-Central RLMAs that would not be likely to exceed harvest guidelines for overfished species targets.

The 2005-2006 seasons and depth restrictions by California management region (Table 2-13) were as follows:

Table 2-13. Summary of 2006 California recreational groundfish seasons and depth restrictions by region under the No Action Alternative.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 30fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed					
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	---	> 40fm Closed					---	---	---
South Region	---	---	> 60fm Closed						>30 fm Closed		> 60fm Closed	

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

Southern RLMA (U.S./Mexico Border to Point Conception at 34°27' N latitude)

The California recreational groundfish fishery regulations south of Point Conception under the No Action Alternative were the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through August and November through December shoreward of 60 fm; open September through October shoreward of 30 fm; and closed January and February.
- California scorpionfish can only be retained during October and November shoreward of 40 fm and December shoreward of 20 fm (closed January through September).
- Fishing is allowed within the Cowcod Conservation Areas (Figure 2-3) shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

Southern South-Central RLMA (Point Conception to Lopez Point at 36° N latitude)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through September shoreward of 40 fm (closed January through April and October through December).

Northern South-Central RLMA (Lopez Point to Pigeon Point at 37°11' N latitude)

The California recreational groundfish fishery regulations for the area between Lopez Point and Cape Mendocino under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm (closed January through June).

Northern Central RLMA (Pigeon Point to Cape Mendocino at 40°10' N latitude)

Same regulations as in the Northern South-Central RLMA, except:

- Recreational fishing for groundfish prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.

Northern RLMA (Cape Mendocino to the California/Oregon Border at 42° N latitude)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 40 fm (closed January through June through April).

2.2.3.2 Action Alternative 1

Action Alternative 1 describes the suite of 2007-2008 management measures adopted by the Council for analysis in April 2006 which are the most conservative analyzed in this EIS and therefore tend to constrain fishing opportunities more than the other action alternatives analyzed. They are designed to stay within the Preferred Low OY Alternative for depleted groundfish species (see section 2.1.1.1). Table 2-14 depicts the impacts to depleted groundfish species by sector in 2007 and 2008 associated with the suite of management measures under Action Alternative 1.

2.2.3.2.1 Limited Entry Trawl Fisheries

Table 2-15 depicts the 2007-2008 limited entry trawl management measures under Action Alternative 1. Under this alternative, the trawl RCA is the largest considered for 2007-2008 extending out to the 250 fm in the north and 200 fm in the south (north of 38º N latitude) to stay within the Low Preferred OYs for darkblotched rockfish and Pacific ocean perch. The shoreward RCA line is also extended in to 75 fm in the north and 60-75 fm in the south to reduce mortalities on depleted shelf rockfish, such as bocaccio and canary rockfish, which is responsive to the Low Preferred OYs for those species.

Table 2-14. Projected mortality (mt) of depleted groundfish species by fishing sector under Action Alternative 1.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	9.1	3.7	0.2	66.7	32.4	0.1	0.1
Limited Entry Trawl- Whiting							0
At-sea whiting motherships		1.8		2.5	0.5	15.3	0.0
At-sea whiting cat-proc		0.4		3.3	1.6	26.5	0.0
Shoreside whiting		0.7		2.8	0.9	22.6	0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear							
Sablefish	0.2	0.1	0.1	1.0	0.2	0.0	0.4
Non-Sablefish	5.2	0.0		0.4	0.4	0.5	0.2
Open Access: Directed Groundfish							
Sablefish DTL	0.0	0.0	0.1	0.2	0.1	0.0	0.1
N 40 10 Nearshore	0.0	1.0		0.0	0.0	0.1	0.8
S 40 10 Nearshore	0.0			0.0	0.0		
Other	4.1	0.0		0.0	0.0	0.0	0.0
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		0.7					1.5
OR		1.6				0.1	1.6
CA	16.0	4.8	0.0			1.6	1.2
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	38.9	25.0	0.5	80.8	44.0	116.3	10.9
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	38.9	25.0	0.5	80.8	44.0	116.3	10.9
Low OY Alt	**40**	**32.0**	**4.0**	**130**	**44**	**120**	**12.6**
Difference	1.1	7.0	3.5	49.3	0.0	3.8	1.7
Percent of OY	97.3%	78.1%	12.5%	62.1%	100.1%	96.9%	86.6%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish.

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 2-15. Cumulative bimonthly limits and RCA configurations by area and species for the West Coast limited entry trawl fishery in 2007-2008 under Action Alternative 1.

		RCA Configurations		Cumulative Limits							
SUBAREA	Period	INLINE	OUTLINE	SABLEFISH	LONGSPN	SHORTSPN	DOVER	OTHER FLAT	PETRALE	ARROWTH	SLOPE ROCK
North seaward limits	1	75	250*	10,000	4,000	3,000	50,000	25,000	50,000	5,000	2,000
	2	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	3	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	4	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	5	75	250	10,000	4,000	3,000	10,000	25,000	25,000	5,000	2,000
	6	75	250*	10,000	4,000	3,000	50,000	25,000	50,000	5,000	2,000
North shoreward limits	1	75	250*	7,000	3,000	3,000	20,000	30,000	15,000	5,000	2,000
	2	75	250	7,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	3	75	250	8,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	4	75	250	8,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	5	75	250	7,000	3,000	3,000	10,000	20,000	15,000	5,000	2,000
	6	75	250*	7,000	3,000	3,000	20,000	30,000	15,000	5,000	2,000
38 - 40 10	1	60	200*	12,000	10,000	5,000	50,000	52,000	50,000	5,000	4,000
	2	60	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	3	75	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	4	60	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	5	60	200	12,000	10,000	5,000	10,000	52,000	25,000	5,000	4,000
	6	60	200*	12,000	10,000	5,000	50,000	52,000	50,000	5,000	4,000
S 38	1	60	150	12,000	10,000	5,000	50,000	52,000	50,000	5,000	40,000
	2	60	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	3	75	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	4	60	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	5	60	150	12,000	10,000	5,000	10,000	52,000	25,000	5,000	40,000
	6	60	150	12,000	10,000	5,000	50,000	52,000	50,000	5,000	40,000

note: splitnose limits are the same as slope rock limits south of 40 degrees 10 minutes N latitude

* indicates petrale areas

Action Alternative 1 would reduce the lingcod minimum size limit from 24 inches to 20 inches north of 40°10' N latitude under this alternative.

Under Action Alternative 1, Yelloweye RCAs would be added, which would be closed to limited entry trawl fisheries, including midwater trawl, as defined by the following coordinates:

Washington Extension to the "C-Shaped" YRCA

Washington Department of Fish and Wildlife is proposing an extension to the status quo "C-Shaped" YRCA in waters off northern Washington, which is described as follows:

Beginning at 48°00.00' N latitude, 125°16.00' W longitude;
Then to 48°06.00' N latitude, 125°16.00' W longitude;
Then to 48°00.00' N latitude, 124°54.00' W longitude;
Then to 48°06.00' N latitude, 124°54.00' W longitude;
Then to 48°00.00' N latitude, 125°16.00' W longitude;
and back to the point of origin (Figure 2-6).

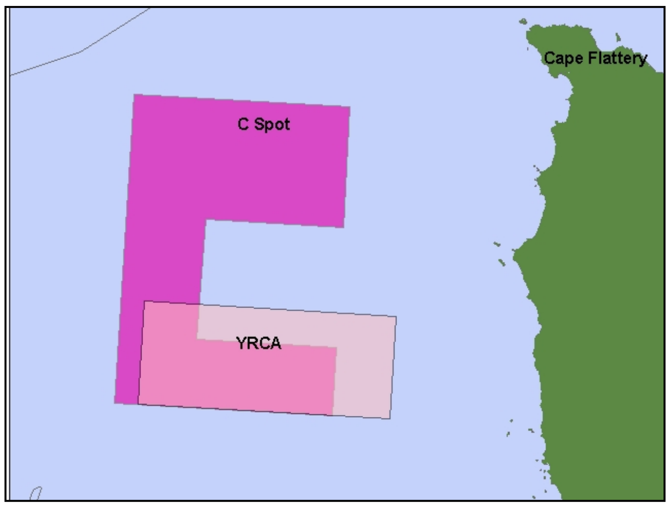

Figure 2-6. A proposed extension to the status quo Yelloweye Rockfish Conservation Area in waters off the Washington north coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

WA North Coast A

Beginning at 48°02.23' N latitude; 125°17.87' W longitude
Then to 48°01.42' N latitude; 125°15.89' W longitude
Then to 47°59.11' N latitude; 125°18.03' W longitude
Then to 47°59.97' N latitude; 125°19.92' W longitude
and back to the point of origin (Figure 2-7).

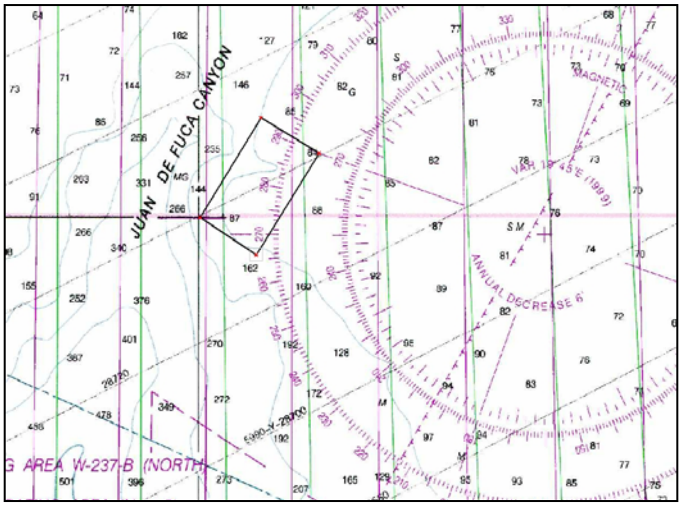

Figure 2-7. A proposed Yelloweye Rockfish Conservation Area (WA North Coast A) in waters off the Washington north coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

WA North Coast B

Beginning at 48º11.77’ N latitude by 125º13.03’ W longitude
Then to 48º16.43’ N latitude by 125º07.55’ W longitude
Then to 48º14.72’ N latitude by 125º01.84’ W longitude
Then to 48º13.36’ N latitude by 125º03.20’ W longitude
Then to 48º12.74’ N latitude by 125º05.83’ W longitude
Then to 48º11.55’ N latitude by 125º04.99’ W longitude
Then to 48º09.96’ N latitude by 125º06.63’ W longitude
Then to 48º09.68’ N latitude by 125º08.75’ W longitude
and back to the point of origin (Figure 2-8).

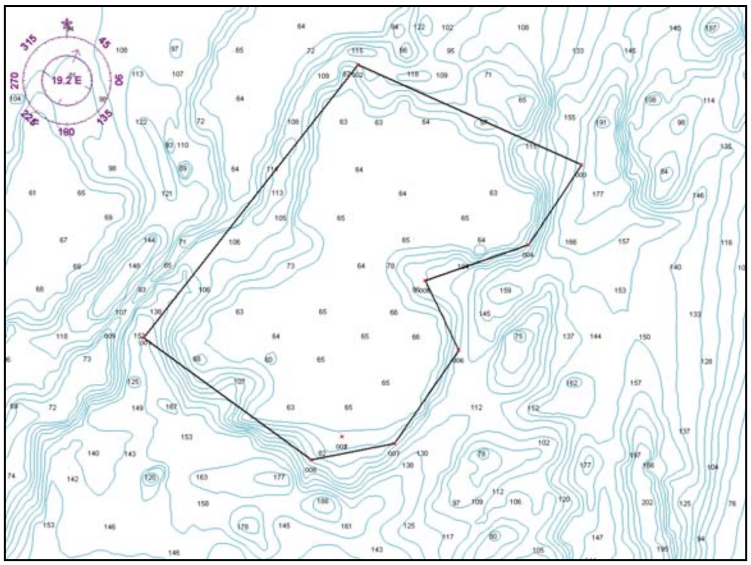

Figure 2-8. A proposed Yelloweye Rockfish Conservation Area (WA North Coast B) in waters off the Washington north coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

WA South Coast A

Beginning at 47°05.00' N latitude; 124°46.50' W longitude
Then to 47°04.00' N latitude; 124°46.50' W longitude
Then to 47°05.00' N latitude; 124°48.00' W longitude
and back to the point of origin (Figure 2-9).

WA South Coast B

Beginning at 46°58.00' N latitude; 124°48.00' W longitude
Then to 46°55.00' N latitude; 124°48.00' W longitude
Then to 46°58.00' N latitude; 124°49.00' W longitude
and back to the point of origin (Figure 2-9).

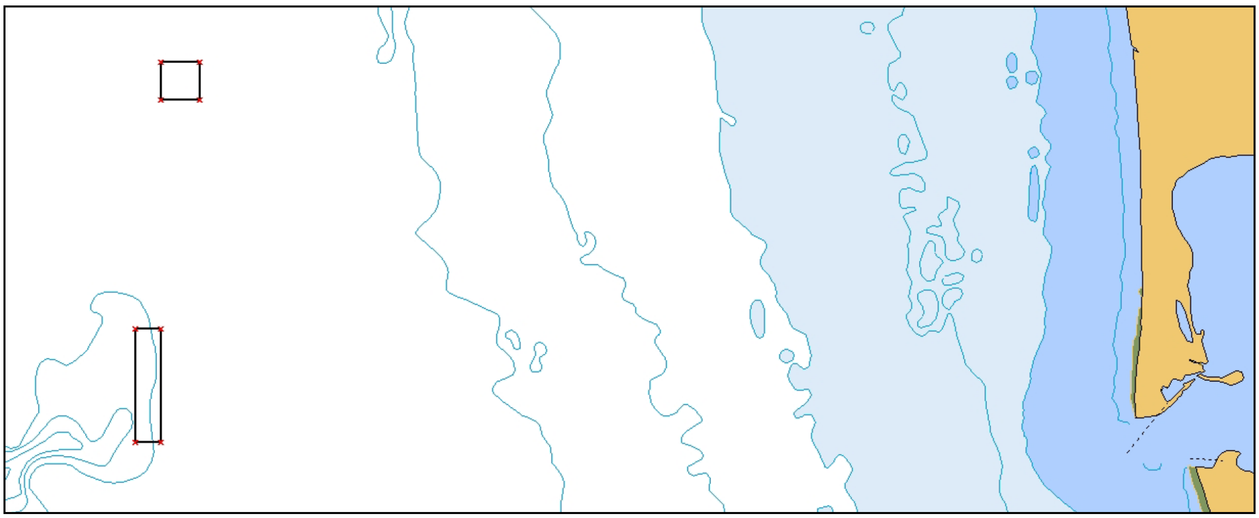

Figure 2-9. Two proposed Yelloweye Rockfish Conservation Areas (WA South Coast A and B) in waters off the Washington south coast where all fishing would be prohibited in 2007-2008 under Action Alternatives 1-3.

Non-Whiting Trawl Fishery

There are no additional management measures than those described above for non-whiting trawl fisheries in 2007 and 2008 under Action Alternative 1.

Whiting Trawl Fishery

Predicted impacts to depleted groundfish species in 2007-2008 whiting-directed fisheries under Action Alternatives 1-3 are depicted in Table 2-16. Higher whiting OYs are not possible given the bycatch constraints imposed by depleted groundfish species under the preferred OYs. However, it is important to note that an alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

Table 2-16. Predicted impacts to depleted groundfish species using a weighted average of observed bycatch rates in 2002-2005, sector whiting allocations, and estimated exvessel revenues for the 2007-2008 whiting fishery under Action Alternatives 1-3.

Action Alternatives	US Catch	Fathom Line	Sector	Allocation	Canary	Darkblotched	POP	Widow	Yelloweye	Exvessel Rev
Alt. 3	260,000	none	Tribal	35,000	1.6	0.0	0.6	6.0	-	$4,089,570.1
			Mothership	53,520	3.2	4.5	0.9	27.7	0.0	$6,253,536.9
			CP	75,820	0.7	6.0	2.8	48.1	0.0	$8,859,177.3
			Shoreside	93,660	1.3	5.0	1.7	41.0	0.0	$10,943,689.6
			Total		6.8	15.5	6.1	122.8	0.0	$30,145,973.9
Alt. 2	200,000	none	Tribal	27,500	1.2	0.0	0.5	4.8	-	$3,213,233.7
			Mothership	40,920	2.5	3.4	0.7	21.2	0.0	$4,781,291.7
			CP	57,970	0.5	4.6	2.2	36.8	0.0	$6,773,496.5
			Shoreside	71,610	1.0	3.8	1.3	31.3	0.0	$8,367,260.4
			Total		5.2	11.9	4.7	94.0	0.0	$23,135,282.3
Alt. 1	150,000	none	Tribal	25,000	1.1	0.0	0.5	4.3	-	$2,921,121.5
			Mothership	29,520	1.8	2.5	0.5	15.3	0.0	$3,449,260.3
			CP	41,820	0.4	3.3	1.6	26.5	0.0	$4,886,452.0
			Shoreside	51,660	0.7	2.8	0.9	22.6	0.0	$6,036,205.5
			Total		4.0	8.6	3.5	68.7	0.0	$17,293,039.3

2.2.3.2.2 Limited Entry Fixed Gear Fisheries

Under Action Alternative 1, the seaward line of the non-trawl RCA is extended out to 150 fm north of Pt. Conception at 34°27' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry fixed gear fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

South of Pt. Conception, the non-trawl RCA would be extended shoreward to 40 fm and seaward to 180 fm to reduce canary, cowcod, yelloweye, and particularly bocaccio mortality under this alternative.

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow limited entry fixed gear vessels access to fish in four distinct Groundfish Fishing Areas (GFAs) deeper than 175 fm (Figure 2-10).

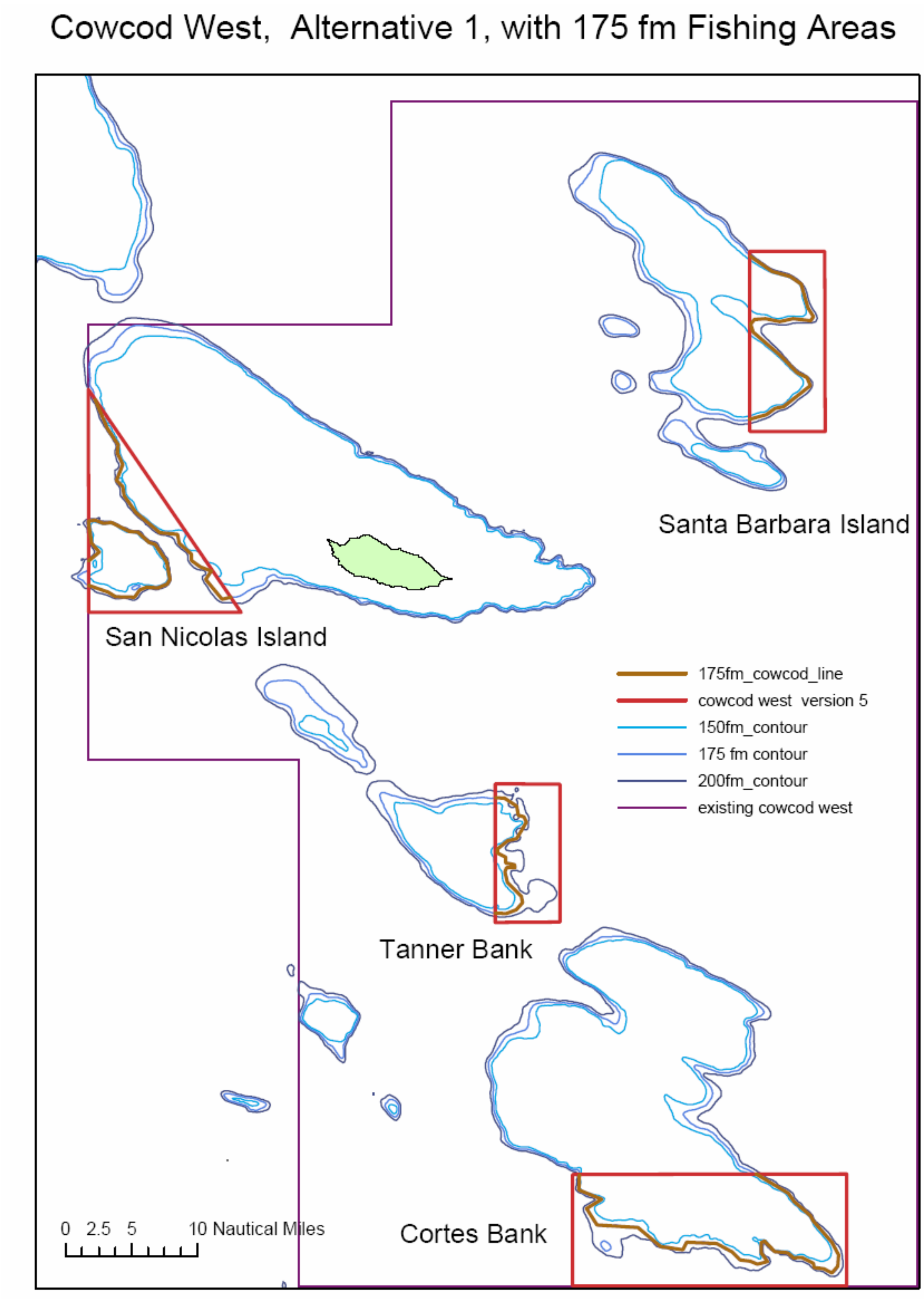

Figure 2-10. Modifications proposed for the western Cowcod Conservation Area in the Southern California Bight under Action Alternative 1 to allow limited entry fixed gear and open access fishing in four distinct Groundfish Fishing Areas (inside red polygons) in depths greater than 175 fm (brown contour).

.2.3.2.3 Open Access Fisheries

Under Action Alternative 1, the seaward line of the non-trawl RCA is extended out to 150 fm north of Pt. Conception at 34°27' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection. The proposed yelloweye RCAs off the Washington coast would also be closed to open access fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

South of Pt. Conception, the non-trawl RCA would be extended shoreward to 40 fm and seaward to 180 fm to reduce canary, cowcod, yelloweye, and particularly bocaccio mortality under this alternative.

Directed Groundfish Fisheries

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow open access vessels targeting groundfish using fixed gears access to fish in four distinct Groundfish Fishing Areas (GFAs) deeper than 175 fm (Figure 2-10).

Incidental Groundfish Fisheries

An additional yelloweye RCA is considered under Action Alternative 1 (as well as Action Alternatives 2 and 3) where commercial salmon trolling would be prohibited (Figure 2-11). This salmon troll RCA is defined by the following coordinates:

Beginning at 48°00.00’ N latitude by 125°14.00’ W longitude
Then to 48°02.00’ N latitude by 125°14.00’ W longitude
Then to 48°00.00’ N latitude by 125°16.50’ W longitude
and back to the point of origin.

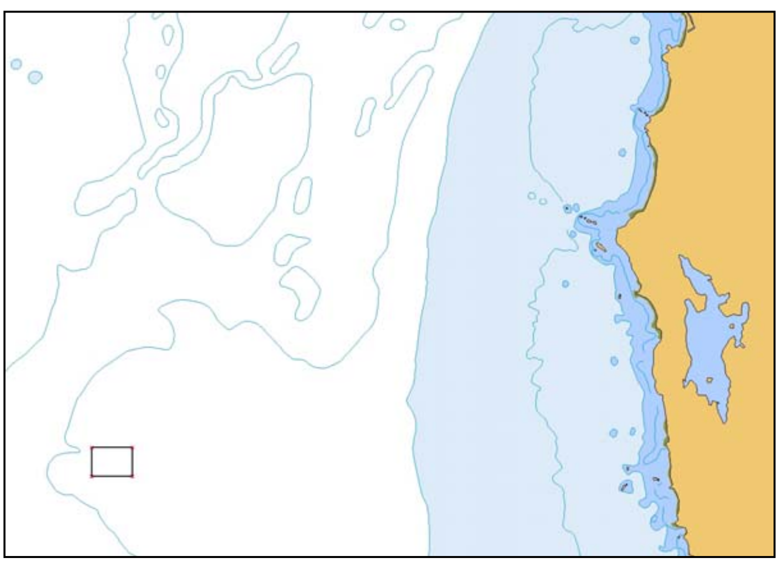

Figure 2-11. A yelloweye RCA off the north Washington coast where commercial salmon trolling would be prohibited under Action Alternatives 1-3.

Under Action Alternative 1, the following management measures would also apply to the commercial

salmon troll fishery north of 40°10' N latitude:
- Consistent with the salmon troll regulations off Oregon, allow the retention of lingcod in the salmon troll fishery when fishing shoreward of a line approximating 30 fm.
- As a canary rockfish bycatch reduction measure, prohibit the use of "hoochies" on the bottom spread.

2.2.3.2.4 Nearshore Commercial Fisheries

Nearshore Commercial Fisheries North of 40°10' N latitude

Under Action Alternative 1, the shoreward non-trawl RCA boundary is adjusted from 30 fm (status quo) to 20 fm from 40°10' N latitude to the Oregon-Washington border at 46°16' N latitude (Table 2-12). In addition, the harvestable amount of black rockfish available to this fishery is reduced from status quo levels by 60%. As current trip limits are at the minimum level deemed viable by the fishery participants, a 60 % reduction in target catch would result in a 60% reduction in season duration (< than a 6 month season). The same magnitude of reduced catch may also be attained by utilizing one, or a combination of, the following options: 1) restricting the fishery to waters shoreward of 10 or 15 fm; 2) reducing the duration of the fishery, resulting in a very short season; 3) a fishery closure in some or all areas; and/or 4) reduced harvest of target species.

Nearshore Commercial Fisheries South of 40°10' N latitude

Under Action Alternative 1 from 40°10' N latitude 34°27' N latitude, the shoreward non-trawl RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 20 fm during all periods (Table 2-12b). In addition, the harvestable amount of shallow and deeper nearshore rockfish available to this fishery is reduced from status quo levels by 15%. As current trip limits are at the minimum level deemed viable by the fishery participants, a 15% reduction in target catch would result in a 15% reduction in season duration (i.e., an 8 month season). The same magnitude of reduced catch may also be attained by utilizing one, or a combination of, the following options: 1) restricting the fishery to waters shoreward of 10 or 15 fm; 2) reducing the duration of the fishery, resulting in a very short season; 3) a fishery closure in some or all areas; and/or 4) further reduced harvest of target species. Under Action Alternative 1 from 34°27' N latitude to the U.S./Mexico border, the shoreward non-trawl RCA boundary is adjusted from 60 fm (status quo) to 40 fm. The same magnitude of reduced catch may also be attained by utilizing one, or a combination of, the following options: 1) restricting the fishery to waters shoreward of 30 or 20 fm; 2) reducing the duration of the fishery, resulting in a very short season; 3) a fishery closure in some or all areas; and/or 4) reduced harvest of target species.

2.2.3.2.5 Tribal Fisheries

Under all the action alternatives, the following regulations will apply to 2007-2008 tribal groundfish fisheries.

Black Rockfish - The 2007 and 2008 tribal harvest guidelines will be set at 20,000 pounds for the management area between the US/Canada border and Cape Alava, and 10,000 pounds for the management area located between Destruction Island and Leadbetter Point. No tribal harvest restrictions are proposed for the management area between Cape Alava and Destruction Island.

Sablefish - The 2007 and 2008 tribal set asides for sablefish will be set at 10 percent of the Monterey through Vancouver area OY minus 1.9 percent to account for estimated discard mortality. Allocations among tribes and among gear types, if any, will be determined by the tribes.

Pacific cod - The tribes will be subject to a 400 mt harvest guideline for 2007 and 2008.

For all other tribal groundfish fisheries the following trip limits will apply:

Thornyheads - Tribal fisheries will be restricted to the Limited Entry trip limits in place at the beginning of the year for both shortspine and longspine thornyheads.

Canary Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit.

Other Minor Nearshore, Shelf and Slope Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit for each species group, or the limited entry trip limits if they are less restrictive than the 300 pound per trip limit.

Yelloweye Rockfish - The tribes will continue developing depth, area, and time restrictions in their directed Pacific halibut fishery to minimize impacts on yelloweye rockfish. Tribal fisheries will be restricted to 100 pounds per trip.

Spiny Dogfish - The Makah Tribe is proposing a directed longline fishery for spiny dogfish for 2007 and 2008. The fishery would be restricted to the Limited Entry trip limits. Increased landings of dogfish by treaty fishermen in 2007 and 2008 would be dependent on successful targeting in 2006 while staying within current estimates of impacts on overfished species.

Full Retention - The tribes will require full retention of all overfished rockfish species as well as all other marketable rockfishes during treaty fisheries.

Tribal Proposals Regarding Makah Trawl fisheries for 2007 and 2008

Midwater Trawl Fishery - Treaty midwater trawl fishermen will be restricted to a cumulative limit of yellowtail rockfish, based on the number of vessels participating, not to exceed 180,000 pounds per two month period for the entire fleet. Their landings of widow rockfish must not exceed 10 percent of the poundage of yellowtail rockfish landed in any given period. The tribe may adjust the cumulative limit for any two-month period to minimize the incidental catch of canary and widow rockfish, provided the average cumulative limit does not exceed 180,000 pounds for the fleet.

Bottom Trawl Fishery - Treaty fishermen using bottom trawl gear will be subject to the trip limits applicable to the limited entry fishery for Dover sole, English sole, rex sole, arrowtooth flounder, and other flatfish. For petrale sole, fishermen would be restricted to 50,000 pounds per two month period for the entire year. Because of the relatively modest expected harvest, the trip limits for the tribal fishery will be those in place at the beginning of the season in the limited entry fishery and will not be adjusted downward, nor will time restrictions or closures be imposed, unless in-season catch statistics demonstrate that the tribe has taken half of the harvest in the tribal area. Fishermen will be restricted to small footrope (≤ 8 inches) trawl gear. Exploration of the use of selective flatfish trawl gear will be conducted in 2006.

Observer Program - The Makah Tribe has an observer program in place to monitor and enforce the limits proposed above.

2.2.3.2.6 Washington Recreational Fisheries

Under Action Alternative 1, WDFW is not proposing any changes to the bottomfish bag limit, minimum size limits, or lingcod season dates described under the No Action Alternative. However, the proposed yelloweye RCAs off the Washington coast would also be closed to Washington recreational fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8). These additional yelloweye RCAs would require a change to the Pacific Halibut Catch Sharing Plan. Other new management measures are considered under Action Alternative 1 as follows:

Management Measures for Marine Areas 3 and 4 (Queets River to the U.S./Canada border)

Under Action Alternative 1, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 10 fm during the months of May, August, and September; close the North Coast to halibut fishing, except in Area 4B; and prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from June 1 through July 31. This alternative would require a change to the Pacific Halibut Catch Sharing Plan.

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Under Action Alternative 1, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 30 fm from lingcod opening day through July 31; prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from August 1 through September 30.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

There is very little yelloweye and canary rockfish (0.03 mt and 0.02 mt, respectively, in 2005) caught in Marine Area 1; therefore, WDFW proposes to keep the status quo (No Action) bottomfish fishing regulations in place through 2007 and 2008.

2.2.3.2.7 Oregon Recreational Fisheries

Under Action Alternative 1a (there are two suboptions for the 2007-2008 Oregon recreational fishery under Action Alternative 1), the Oregon recreational groundfish fishery would only be open in depths ≤20 fm from July 1 through Labor Day. The minimum size limit for lingcod would be 20-inches, and anglers would be allowed to retain 3 lingcod per day. Minimum size limits for cabezon and greenling species would be the same as for the No Action Alternative. However, under this alternative the marine fish daily bag limit would increase to 10 marine fish, with all other regulations the same as in the No Action Alternative, except for the following expansion of the Stonewall Banks closure in the Pacific halibut fishery. The additional closure, designed to reduce yelloweye rockfish mortality and hence termed a yelloweye RCA (YRCA), is defined by the following coordinates:

1	44º41.71 N latitude	124º29.99 W longitude
2	44º41.68 N latitude	124º21.60 W longitude
3	44º27.66 N latitude	124º17.01 W longitude
4	44º25.22 N latitude	124º17.01 W longitude
5	44º25.27 N latitude	124º30.11 W longitude

Returning to the first point (Figure 2-5).

This expanded Stonewall Banks closure would only apply to the Pacific halibut fishery since this area is seaward of the 20 fm line and, under this alternative, all groundfish retention is prohibited seaward of the 20 fm line.

Under Action Alternative 1b, the Oregon recreational groundfish fishery would be open from April through September shoreward of the 20 fm line. A 30% reduction in yelloweye rockfish impacts would be achieved by reducing Pacific halibut quota and time on the water in that fishery. The marine fish daily bag limit would be the same as under the No Action Alternative, or 6 marine fish daily. The minimum size limit for lingcod would be 20 inches, and anglers would be allowed to retain 3 lingcod per day. All other groundfish regulations would be the same as under the No Action Alternative except for the expansion of the Stonewall Banks closure in the Pacific halibut fishery described under Action Alternative 1a.
This expanded Stonewall Banks closure would only apply to the Pacific halibut fishery since this area is seaward of the 20 fm line and, under this alternative, all groundfish retention is prohibited seaward of the 20 fm line.

Predicted yelloweye rockfish impacts under both alternatives 1a and 1b are similar (see section 4.3.1.7).

2.2.3.2.8 California Recreational Fisheries

Under Action Alternative 1, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 1 include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Within a general bag limit of 20 fish, a combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish, of which one can be a cabezon and one can be a greenling of the genus *Hexagrammos*.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

California recreational groundfish management measures that differ from status quo under Action Alternative 1 include the following:

- A statewide one-fish bocaccio sublimit is included in the 10-fish RCG daily bag limit.
- Lingcod daily bag limit of 1 fish, but with a minimum size limit of 22 inches.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 1 are described below and summarized in Table 2-17.

- Fishing is allowed within the Cowcod Conservation Areas shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

Table 2-17. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 1.

RCG SEASON BY REGION:

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 20fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed			---	> 20fm Closed	
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	---	> 20fm Closed					---	---	---
South Region*	---	---	> 30fm Closed									

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-February and 0-30 fm March-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 1 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through December shoreward of the 30 fm line and otherwise closed.
- California scorpionfish is open year-round, but restricted to depths ≤40 fm during January and February, and ≤30 fm during March through December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through September shoreward of the 20 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Pigeon Point under the Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through September and November through December shoreward of 20 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 1 would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 20 fm and otherwise closed.

2.2.3.3 Action Alternative 2

Action Alternative 2 is intermediate to Action Alternatives 1 and 3 in constraints to 2007 and 2008 fishing opportunities and intermediate in terms of impacts to depleted and target groundfish species. Table 2-19 depicts the impacts to depleted groundfish species by sector in 2007 and 2008 associated with the suite of management measures under Action Alternative 2.

2.2.3.3.1 Limited Entry Trawl Fisheries

Table 2-18 depicts the 2007-2008 limited entry trawl management measures under Action Alternative 2. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry trawl fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Table 2-18. Cumulative bimonthly limits and RCA configurations by area and species for the West Coast limited entry trawl fishery in 2007-2008 under Action Alternative 2.

		RCA Configurations		Cumulative Limits							
SUBAREA	Period	INLINE	OUTLINE	SABLEFISH	LONGSPN	SHORTSPN	DOVER	OTHER FLAT	PETRALE	ARROWTH	SLOPE ROCK
North seaward limits	1	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
	2	75	200	14,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	3	75	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	4	75	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	5	75	200	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	6	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
North shoreward limits	1	75	200*	5,000	3,000	3,000	40,000	80,000	16,000	80,000	4,000
	2	75	200	9,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	3	75	250	11,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	4	75	250	11,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	5	75	200	9,000	3,000	3,000	40,000	80,000	25,000	80,000	4,000
	6	75	200*	5,000	3,000	3,000	40,000	80,000	16,000	80,000	4,000
38 - 40 10	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
S 38	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000

note: splitnose limits are the same as slope rock limits south of 40 degrees 10 minutes N latitude

* indicates petrale areas

Action Alternative 2 would reduce the lingcod minimum size limit from 24 inches to 22 inches north of 40°10' N latitude under this alternative.

Table 2-19. Projected mortality (mt) of depleted groundfish species by fishing sector under Action Alternative 2.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Y'eye '07	*Y'eye '08*
Limited Entry Trawl- Non-whiting	50.5	7.5	2.9	179.6	85.6	1.0	0.2	*0.2*
Limited Entry Trawl- Whiting								
At-sea whiting motherships		2.5		3.4	0.7	21.2	0.0	*0.0*
At-sea whiting cat-proc		0.5		4.6	2.2	36.8	0.0	*0.0*
Shoreside whiting		1.0		3.8	1.3	31.3	0.0	*0.0*
Tribal whiting		1.6		0.0	0.6	6.1	0.0	*0.0*
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	*0.0*
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	*0.0*
Troll		0.5		0.0	0.0		0.0	*0.0*
Fixed gear		0.3		0.0	0.0	0.0	2.3	*2.3*
Limited Entry Fixed Gear								
Sablefish	13.4	0.3	0.1	0.7	0.3	0.0	0.8	*0.8*
Non-Sablefish		0.2		0.4	0.4	0.5	0.6	*0.6*
Open Access: Directed Groundfish								
Sablefish DTL	0.0	0.1	0.1	0.2	0.1	0.0	0.2	*0.2*
N 40 10 Nearshore	0.0	1.5		0.0	0.0	0.1	1.3	*1.3*
S 40 10 Nearshore	0.0			0.0	0.0			
Other	10.6	0.0		0.0	0.0	0.0	0.0	*0.0*
Limited Entry Fixed Gear								
Open Access: Directed Groundfish								
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	*0.0*
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	*0.1*
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	*0.5*
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Spot Prawn (trap)								
Recreational Groundfish								
WA		0.8					1.8	*1.8*
OR		2.6				0.1	1.9	*1.9*
CA	31.7	5.9	0.1			3.2	1.5	*1.5*
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	*3.0*
Non-EFP Total	110.5	33.1	3.3	196.6	98.5	143.7	14.3	*14.3*
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
TOTAL	110.5	33.1	3.3	196.6	98.5	143.7	14.3	*14.3*
High OY Alt	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	***20***
Difference	107.5	10.9	4.7	32.5	1.5	224.4	8.7	*5.7*
Percent of OY	50.7%	75.2%	41.3%	85.8%	98.5%	39.0%	62.0%	*71.3%*
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.
b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish.

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Non-Whiting Trawl Fishery

There are no additional management measures than those described above for non-whiting trawl fisheries in 2007 and 2008 under Action Alternative 2.

Whiting Trawl Fishery

Predicted impacts to depleted groundfish species in 2007-2008 whiting-directed fisheries under Action Alternatives 1-3 are depicted in Table 2-16. Higher whiting OYs are not possible given the bycatch constraints imposed by depleted groundfish species under the preferred OYs. However, it is important to note that an alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

2.2.3.3.2 Limited Entry Fixed Gear Fisheries

Under Action Alternative 2, the seaward line of the non-trawl RCA is extended out to 125 fm north of Cape Mendocino at 40°10' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection relative to status quo management measures. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry fixed gear fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow limited entry fixed gear vessels access to fish in depths deeper than 175 fm (Figure 2-12).

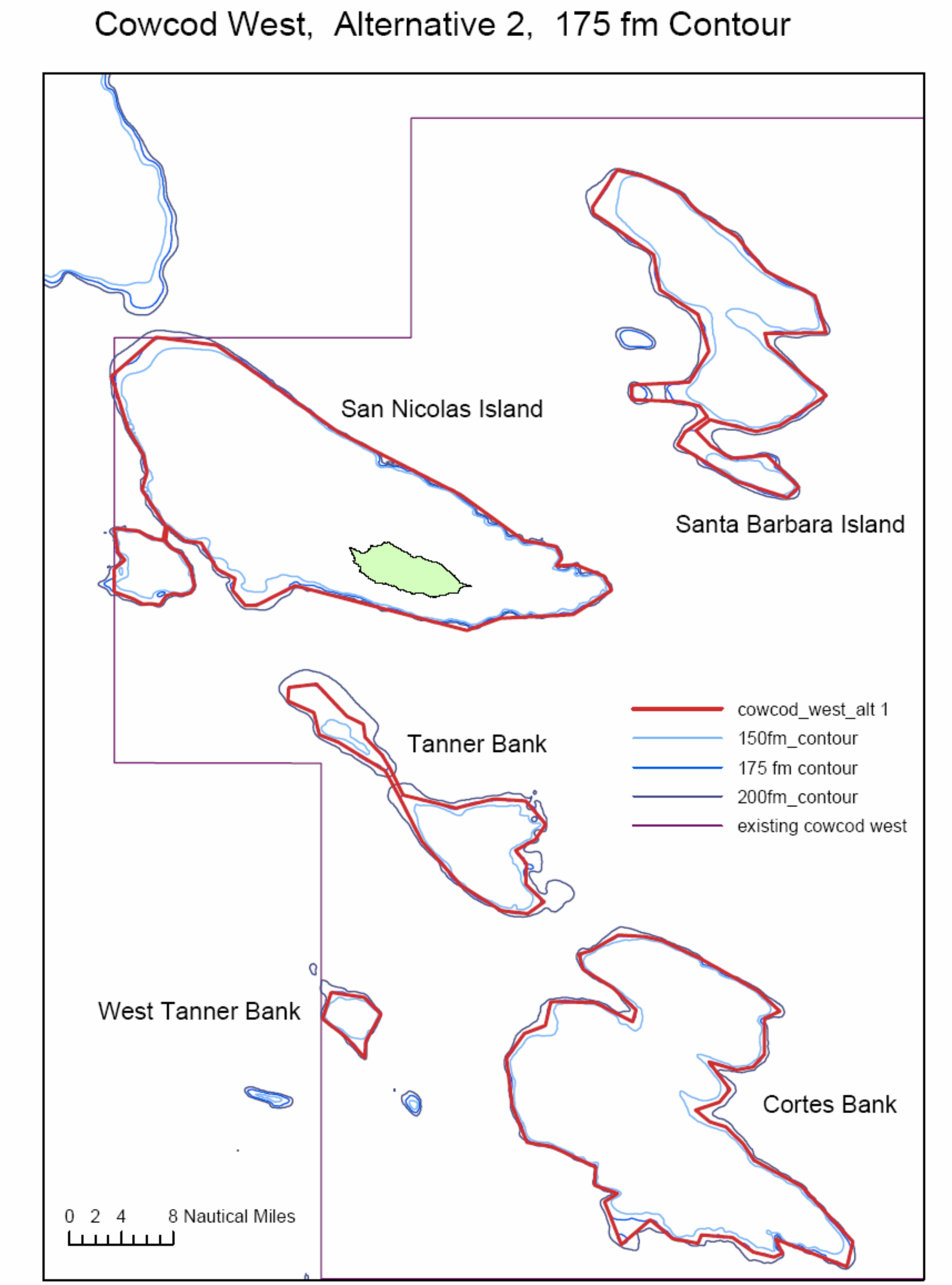

Figure 2-12. Modifications proposed for the western Cowcod Conservation Area in the Southern California Bight under Action Alternative 2 to allow limited entry fixed gear and open access fishing in depths greater than 175 fm (red contour).

2.2.3.3.3 Open Access Fisheries

Under Action Alternative 2, the seaward line of the non-trawl RCA is extended out to 125 fm north of Cape Mendocino at 40°10' N latitude to the U.S.-Canada border to provide additional canary and yelloweye rockfish protection relative to status quo management measures. The proposed yelloweye RCAs off the Washington coast would also be closed to open access fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Directed Groundfish Fisheries

The seaward boundary of the western Cowcod Conservation Area would be modified under this alternative to allow open access vessels targeting groundfish using fixed gears access to fish in depths deeper than 175 fm (Figure 2-12).

Incidental Groundfish Fisheries

Additional management measures to those described above considered for open access fisheries that incidentally catch groundfish species under this alternative apply to the commercial salmon troll fishery north of 40°10' N latitude as follows:
Under Action Alternative 1, the following management measures would also apply to the commercial salmon troll fishery north of 40°10' N latitude:

- Prohibit commercial salmon trolling in the proposed yelloweye RCA in waters off northern Washington described under Action Alternative 1 (Figure 2-11).
- Prohibit the retention of lingcod in the salmon troll fishery shoreward of the non-trawl RCA seaward boundary (e.g., shoreward of 100 fm north of 40°10’ N latitude, under status quo).
- As a canary rockfish bycatch reduction measure, prohibit the use of “hoochies” on the bottom spread.

2.2.3.3.4 Nearshore Commercial Fisheries

Nearshore Commercial Fisheries North of 40°10' N latitude

Under Action Alternative 2, the shoreward RCA boundary is adjusted from 30 fm (status quo) to 20 fm from 40°10' N latitude to the Oregon-Washington border at 46°16' N latitude (Table 2-12). In addition, the harvestable amount of black rockfish available to this fishery is reduced from status quo levels by 10%. The same amount of savings may occur by further adjustment of the shoreward RCA boundary (i.e. 15 fm), resulting in status quo harvest of target species.

Nearshore Commercial Fisheries South of 40°10' N latitude

Under Action Alternative 2, from 40°10' N latitude 34°27’ N latitude, the shoreward non-trawl RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 20 fm during all periods (Table 2-12b). In addition, the harvestable amount of shallow and deeper nearshore rockfish available to this fishery is reduced from status quo levels by 5%. The same amount of savings may occur by further adjustment of the shoreward RCA boundary (i.e. 15 fm), or reducing the season duration (9 months), resulting in status quo harvest of target species. Action Alternative 2 from 34°27’ N latitude to the US/Mexico border represents status quo management. CDFG would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Director of CDFG or by the California Fish and Game Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

2.2.3.3.5 Tribal Fisheries

Groundfish management measures are the same as described for tribal fisheries under Action Alternative 1. The tribes proposed only one action alternative for analysis.

2.2.3.3.6 Washington Recreational Fisheries

Under Action Alternative 2, WDFW is not proposing any changes to the bottomfish bag limit, minimum size limits, or lingcod season dates described under the No Action Alternative. However, the proposed yelloweye RCAs off the Washington coast would also be closed to Washington recreational fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8). These additional yelloweye RCAs would require a change to the Pacific Halibut Catch Sharing Plan. Other new management measures are considered under Action Alternative 2 as follows:

Management Measures for Marine Areas 3 and 4 (Queets River to the U.S./Canada border)

Under Action Alternative 2, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 10 fm during the months of May and September; close the North Coast to halibut fishing, except in Area 4B; and prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from June 1 through August 31. This alternative would require a change to the Pacific Halibut Catch Sharing Plan.

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Under Action Alternative 2, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 30 fm from lingcod opening day through August 31.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

There is very little yelloweye and canary rockfish (0.03 mt and 0.02 mt, respectively, in 2005) caught in Marine Area 1; therefore, WDFW proposes to keep the status quo (No Action) bottomfish fishing regulations in place through 2007 and 2008.

2.2.3.3.7 Oregon Recreational Fisheries

Under Action Alternative 2, the Oregon recreational groundfish fishery would be open all year shoreward of the 20 fm line. The marine fish daily bag limit would be reduced to 5 marine fish. Other changes to status quo (No Action) management measures under this alternative include a decrease in the lingcod minimum size limit to 22 inches. All other management measures, including the current Stonewall Banks closure for the Pacific halibut fishery under this alternative are the same as under the No Action Alternative. The additional YRCA contemplated under Action Alternative 1 would not apply to the directed recreational groundfish fishery under this alternative since the proposed closed area is seaward of the 20 fm line.

2.2.3.3.8 California Recreational Fisheries

Under Action Alternative 2, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 2 include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish.
- No retention of cowcod, canary, or yelloweye rockfish.
- Lingcod size limit of 24 inches with a daily bag limit of two fish.
- A two-fish bocaccio sublimit included in the 10-fish RCG daily bag limit.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

California recreational groundfish management measures that differ from status quo under Action Alternative 2 include the following:

- Two cabezon and two greenling of the genus *Hexagrammos* sublimit is included in the 10-fish RCG daily bag limit.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 2 are described below and summarized in Table 2-20.

Table 2-20. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 2.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	>30fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed					
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	> 20fm Closed						---	---	---
South Region*	---	---	> 40fm Closed						> 30fm Closed		> 60fm Closed	

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING
*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-August, 0-30 fm September-October and 0-60 fm November-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 2 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through August shoreward of the 40 fm line, September through October shoreward of the 30 fm line, November and December shoreward of the 60 fm line, and otherwise closed.
- California scorpionfish is open year-round, but restricted to depths ≤40 fm during January-August, ≤30 fm during September and October, and ≤60 fm during November and December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open April through September shoreward of the 20 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Cape Mendocino under the Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 2 would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 30 fm and otherwise closed.

2.2.3.4 Action Alternative 3

Action Alternative 3 is the most liberal action alternative analyzed in this EIS. More fishing opportunities, and hence greater impacts to groundfish species, are predicted under this alternative. The only other alternative analyzed that may be less constraining to 2007-2008 fishing opportunities may be the No Action Alternative, if those management measures were implemented in the next management cycle. Table 2-21 depicts the impacts to depleted groundfish species by sector in 2007 and 2008 associated with the suite of management measures under Action Alternative 3.

2.2.3.4.1 Limited Entry Trawl Fisheries

Table 2-22 depicts the 2007-2008 limited entry trawl management measures under Action Alternative 3. The proposed yelloweye RCAs off the Washington coast would also be closed to limited entry trawl fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Under Action Alternative 3, the boundaries of the Cowcod Conservation Areas in the Southern California Bight would be eliminated and the depth-based RCAs specified for south of Pt. Conception would instead be implemented in this area.

Non-Whiting Trawl Fishery

There are no additional management measures than those described above for non-whiting trawl fisheries in 2007 and 2008 under Action Alternative 3.

Whiting Trawl Fishery

Predicted impacts to depleted groundfish species in 2007-2008 whiting-directed fisheries under Action Alternatives 1-3 are depicted in Table 2-16. Higher whiting OYs are not possible given the bycatch constraints imposed by depleted groundfish species under the preferred OYs. However, it is important to note that an alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

2.2.3.4.2 Limited Entry Fixed Gear Fisheries

Status quo management measures are specified for limited entry fixed gear fisheries under this alternative, except the proposed yelloweye RCAs off the Washington coast would also be closed to limited entry fixed gear fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8).

Under Action Alternative 3, the boundaries of the Cowcod Conservation Areas in the Southern California Bight would be eliminated and the depth-based RCAs specified for south of Pt. Conception would instead be implemented in this area.

Table 2-21. Projected mortality (mt) of depleted groundfish species by fishing sector under Action Alternative 3.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Y'eye '07	*Y'eye '08*
Limited Entry Trawl- Non-whiting	50.5	8.5	2.9	181.1	85.9	1.0	0.2	*0.2*
Limited Entry Trawl- Whiting								
At-sea whiting motherships		3.4		4.7	0.9	28.8	0.0	*0.0*
At-sea whiting cat-proc		0.7		6.3	2.8	50.0	0.0	*0.0*
Shoreside whiting		1.4		5.2	1.7	42.6	0.0	*0.0*
Tribal whiting		1.6		0.0	0.6	6.1	0.0	*0.0*
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	*0.0*
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	*0.0*
Troll		0.5		0.0	0.0		0.0	*0.0*
Fixed gear		0.3		0.0	0.0	0.0	2.3	*2.3*
Limited Entry Fixed Gear								
Sablefish	13.4	0.5	0.1	0.6	0.2	0.0	1.0	*1.0*
Non-Sablefish		0.4		0.5	0.4	0.5	1.3	*1.3*
Open Access: Directed Groundfish								
Sablefish DTL	0.0	0.1	0.1	0.2	0.1	0.0	0.3	*0.3*
OR Nearshore	0.0	2.0		0.0	0.0	0.1	2.3	*2.3*
CA Nearshore	0.0			0.0	0.0			
Other	10.6	0.0		0.0	0.0	0.0	0.0	*0.0*
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	*0.0*
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	*0.1*
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	*0.5*
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Spot Prawn (trap)								
Recreational Groundfish								
WA		1.4					3.1	*3.1*
OR		4.0				0.6	2.9	*2.9*
CA	106.8	8.6	0.3			18.3	1.3	*1.3*
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	*3.0*
Non-EFP Total	185.6	41.1	3.5	202.5	100.0	191.4	18.3	18.3
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
TOTAL	185.6	41.1	3.5	202.5	100.0	191.4	18.3	*18.3*
High OY Alt	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	***20***
Difference	32.4	2.9	4.5	26.6	0.0	176.6	4.7	*1.7*
Percent of OY	85.1%	93.5%	43.8%	88.4%	100.0%	52.0%	79.7%	*91.7%*
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish.

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 2-22. Cumulative bimonthly limits and RCA configurations by area and species for the West Coast limited entry trawl fishery in 2007-2008 under Action Alternative 3.

		RCA Configurations		Cumulative Limits							
SUBAREA	Period	INLINE	OUTLINE	SABLEFISH	LONGSPN	SHORTSPN	DOVER	OTHER FLAT	PETRALE	ARROWTH	SLOPE ROCK
North seaward limits	1	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
	2	75	200	14,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	3	100	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	4	100	250	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	5	75	200	16,000	12,000	6,000	60,000	110,000	30,000	100,000	4,000
	6	75	200*	14,000	12,000	6,000	60,000	110,000	80,000	100,000	4,000
North shoreward limits	1	75	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	4,000
	2	100	200	9,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	3	100	250	11,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	4	100	250	11,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	5	100	200	9,000	3,000	3,000	40,000	90,000	25,000	90,000	4,000
	6	100	200*	5,000	3,000	3,000	40,000	90,000	16,000	90,000	4,000
38 - 40 10	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	15,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	15,000
S 38	1	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000
	2	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	3	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	4	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	5	100	150	15,000	22,000	7,000	60,000	110,000	30,000	10,000	40,000
	6	100	150	15,000	22,000	7,000	60,000	110,000	80,000	10,000	40,000

note: splitnose limits are the same as slope rock limits south of 40 degrees 10 minutes N latitude

* indicates petrale areas

2.2.3.4.3 Open Access Fisheries

Status quo management measures are specified for open access fisheries under this alternative, except the proposed yelloweye RCAs off the Washington coast would also be closed to open access fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8) and the following:

Under Action Alternative 3, the boundaries of the Cowcod Conservation Areas in the Southern California Bight would be eliminated and the depth-based RCAs specified for south of Pt. Conception would instead be implemented in this area.

Directed Groundfish Fisheries

There are no additional management measures considered for open access fisheries targeting groundfish species than those described above under this alternative.

Incidental Groundfish Fisheries

Additional management measures to those described above considered for open access fisheries that incidentally catch groundfish species under this alternative apply to the commercial salmon troll fishery north of 40°10' N latitude as follows:

- Prohibit commercial salmon trolling in the proposed yelloweye RCA in waters off northern Washington described under Action Alternative 1 (Figure 2-11).
- Allow the retention of lingcod in the salmon troll fishery, subject to an incidental landing ratio of one lingcod per ten Chinook salmon (Option 3a), or
- Allow the retention of lingcod in the salmon troll fishery, subject to an incidental landing ratio of one lingcod per ten Chinook salmon, north of the Oregon/Washington border at 46°16.00’ N latitude (Option 3b).
- As a canary rockfish bycatch reduction measure, prohibit the use of “hoochies” on the bottom spread.

2.2.3.4.4 Nearshore Commercial Fisheries

Nearshore Commercial Fisheries North of 40°10' N latitude

There are two suboptions (Action Alternatives 3a and 3b) for nearshore commercial fisheries from 40°10' N latitude to the Oregon-Washington border at 46°16' N latitude.

Under Action Alternative 3a, the shoreward RCA boundary is adjusted from 30 fm (status quo) to 20 fm with no reduction to the amount of target catch (Table 2-12). Target species harvest levels would be set at levels consistent with adopted ABC/OY levels for those species. ODFW would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Oregon Fish and Wildlife Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

Action Alternative 3b represents a near status quo fishery (Table 2-12). The shoreward RCA boundary is established at 30 fm (status quo). Target species harvest levels would be set at levels consistent with adopted ABC/OY levels for those species. ODFW would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Oregon Fish and Wildlife Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

Nearshore Commercial Fisheries South of 40°10' N latitude

There are two suboptions (Action Alternatives 3a and 3b) for nearshore commercial fisheries from 40°10' N latitude to 34°27’ N latitude.

Under Action Alternative 3a, the shoreward RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 30 fm during all periods. In addition, the harvestable amount of shallow and deeper nearshore rockfish available to this fishery is reduced from status quo levels by 5% (Table 2-12b). This represents near-status quo impacts to canary rockfish.

Under Action Alternative 3b, from 40°10' N latitude 34°27’ N latitude, the shoreward non-trawl RCA boundary is adjusted from 30 fm during periods 1, 2, 5, and 6 and 20 fm during periods 3 and 4 (status quo) to 30 fm during all periods (Table 2-12b). Target species harvest levels would be set at levels consistent with adopted ABC/OY levels for those species.

In both cases, CDFG would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Director of CDFG or by the California Fish and Game Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

Action Alternative 3 from 34°27' N latitude to the US/Mexico border represents status quo management. CDFG would have the ability to manage harvest at more conservative levels, if deemed appropriate by the Director of CDFG or by the California Fish and Game Commission. Catches would be monitored, and the fishery managed to ensure harvest impacts of both target species and associated overfished rockfish did not exceed adopted levels.

2.2.3.4.5 Tribal Fisheries

Groundfish management measures are the same as described for tribal fisheries under Action Alternative 1. The tribes proposed only one action alternative for analysis.

2.2.3.4.6 Washington Recreational Fisheries

Under Action Alternative 3, WDFW is not proposing any changes to the bottomfish bag limit, minimum size limits, or lingcod season dates described under the No Action Alternative. Under this alternative, WDFW would reduce the lingcod minimum size limit to 20 inches in Marine Areas 1-4. The proposed yelloweye RCAs off the Washington coast would also be closed to Washington recreational fisheries under this alternative (Figures 2-5, 2-6, 2-7, and 2-8). These additional yelloweye RCAs would require a change to the Pacific Halibut Catch Sharing Plan. Other new management measures are considered under Action Alternative 3 as follows:

Management Measures for Marine Areas 3 and 4 (Queets River to the U.S./Canada border)

Under Action Alternative 3, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 20 fm from May 1 through June 30, except on days that halibut fishing is open, and from August 1 through September 30; and prohibit retention of rockfish and lingcod seaward of a line approximating 10 fm during the month of July.

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Under Action Alternative 3, WDFW would prohibit retention of rockfish and lingcod seaward of a line approximating 30 fm from the lingcod opening day through July 31.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

There is very little yelloweye and canary rockfish (0.03 mt and 0.02 mt, respectively, in 2005) caught in Marine Area 1; therefore, WDFW proposes to keep the status quo (No Action) bottomfish fishing regulations in place through 2007 and 2008.

2.2.3.4.7 Oregon Recreational Fisheries

Under Action Alternative 3a (there are two suboptions for the 2007-2008 Oregon recreational fishery under Action Alternative 3), the Oregon recreational groundfish fishery would be open all year, but restricted to depths shoreward of the 40 fm line from January 1 through May 31 and September 1 through December 31, and shoreward of the 25 fm line from June 1 through August 31. The marine fish daily bag limit would be reduced to 5 marine fish; however flatfish, including Pacific sanddabs, would be managed under a separate 25 fish daily bag limit for all flatfish species. Other changes to status quo (No Action) management measures under this alternative include a decrease in the lingcod minimum size limit to 22 inches and the expanded Stonewall Banks closure described under Action Alternative 1 would apply to the recreational Pacific halibut fishery, restricting targeting of Pacific halibut in this area. Additionally, retention of groundfish would be prohibited in this area, regardless of trip target. All other management measures under this alternative are the same as under the No Action Alternative.

Under Action Alternative 3b, the Oregon recreational groundfish fishery would be open all year shoreward of the 40 fm line. The marine fish daily bag limit would be reduced to 5 marine fish; however flatfish, including Pacific sanddabs, would be managed under a separate 25 fish daily bag limit for all flatfish species. Other changes to status quo (No Action) management measures under this alternative include a decrease in the lingcod minimum size limit to 22 inches and the expanded Stonewall Banks closure described under Action Alternative 1 would apply to the recreational Pacific halibut fishery, restricting targeting of Pacific halibut in this area. Additionally, retention of groundfish would be prohibited in this area, regardless of trip target. All other management measures under this alternative are the same as under the No Action Alternative.

2.2.3.4.8 California Recreational Fisheries

Under Action Alternative 3, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 3 include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- A two-fish bocaccio sublimit is included in the 10-fish RCG daily bag limit.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

California recreational groundfish management measures that differ from status quo under Action Alternative 3 include the following:

- Combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish, of which two can be a cabezon and two can be a greenling of the genus *Hexagrammos*.
- Lingcod daily bag limit of 3 fish, but with a minimum size limit of 22 inches.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 3 are described below and summarized in Table 2-23.

Table 2-23. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 3.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 40fm Closed							
North Central	---	---	---	---	---		> 40fm Closed					
South Central - Monterey	---	---	---	---	> 40fm Closed							
South Central - Morro Bay	---	---	---	> 40fm Closed							---	---
South Region*	---	---	> 60fm Closed									

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

Only half of month is open

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-February and 0-60 fm March-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 3 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through December shoreward of the 60 fm line and otherwise closed.
- California scorpionfish open year-round, but restricted to depths ≤40 fm in January and February, and ≤60 fm during March through December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open April through mid-October shoreward of the 40 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Pigeon Point under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through December shoreward of 40 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open mid-June through December shoreward of 40 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 40 fm and otherwise closed.

2.2.3.5 The Council-Preferred Action Alternative

This alternative will be decided at the June Council meeting in Foster City, CA.

2.2.3.5.1 Limited Entry Trawl Fisheries

2.2.3.5.2 Limited Entry Fixed Gear Fisheries

2.2.3.5.3 Open Access Fisheries

2.2.3.5.4 Nearshore Commercial Fisheries

2.2.3.5.5 Tribal Fisheries

2.2.3.5.6 Washington Recreational Fisheries

2.2.3.5.7 Oregon Recreational Fisheries

2.2.3.5.8 California Recreational Fisheries

2.2.3.6 Alternatives Considered, But Eliminated From Detailed Study

2.3 Comparison of the Environmental Consequences

To be completed after June 2006 when the Council will adopt a preferred alternative.

2.4 Social Net Benefit Analysis

To be completed after June 2006 when the Council will adopt a preferred alternative.

3.0 WEST COAST MARINE ECOSYSTEMS AND ESSENTIAL FISH HABITAT

3.1 Affected Environment

3.1.1 West Coast Marine Ecosystems

The term ecosystem is generally defined as a "functional unit of the environment" within which the basic processes of energy flow and cycling are identifiable and can be (relatively) localized. In this sense, marine ecosystems are extremely difficult to identify, as most are relatively open systems, with poorly defined boundaries and strong interactions across broad spatial scales. The California Current ecosystem, like other Eastern boundary current ecosystems, are especially difficult to define, as they are characterized by tremendous fluctuations in physical conditions and productivity over multiple time scales {Parrish et al. 1981, Mann and Lazier 1996}. Food webs tend to be structured around coastal pelagic species that exhibit boom-bust cycles over decadal time scales {Bakun 1996, Schwartzlose et al. 1999}. Similarly, the top trophic levels of such ecosystems are often dominated by highly migratory species such as salmon, albacore tuna, sooty shearwaters, fur seals and baleen whales, whose dynamics may be partially or wholly driven by processes in entirely different ecosystems, even different hemispheres. For this analysis, the ecosystem is considered in terms of physical and biological oceanography, climate, biogeography, essential fish habitat (EFH) marine protected areas, and the role of depleted species' rebuilding in the marine ecosystem.

3.1.2 Physical and Biological Oceanography

The California Current is essentially the eastern limb of the Central Pacific Gyre, and begins where the west wind drift (or the North Pacific Current) reaches the North American Continent. This occurs near the northern end of Vancouver Island, roughly between 45° and 50° N latitude and 130° to 150° W longitude {Ware and McFarlane 1989}. A divergence in the prevailing wind patterns causes the west wind drift to split into two broad coastal currents, the California Current to the south and the Alaska Current to the north. As there are really several dominant currents in the region, all of which vary in geographical location, intensity, and direction with the seasons, this region is often referred to as the California Current System {Hickey 1979}.

The California Current itself is a year-round feature consisting of a massive southward flow of the cool waters of the west wind drift. The current is best characterized as a shallow, wide, and slow-moving body of water, ranging from the shelf break to 1,000 km offshore, with the strongest flows at the sea surface, and in the summertime {Dodimead et al. 1963, Hickey 1979, Lynn and Simpson 1987}. This surface current is matched in the summer by the California Undercurrent, which moves water northward from the south in a deep yet narrow band of subtropical water typically found just off of the shelf break at depths of 100 to 300 m. The undercurrent flows from Baja California to Vancouver Island, transporting warmer, saltier southern water north along the coast {Hickey 1979}. On average, the California Current flow volume reaches a maximum in spring and summer, when the flow moves inshore, closer to the shelf break. The California Undercurrent develops in late spring through early summer and persists into the fall. During late summer and fall, there is considerably more mesoscale variability in flow patterns, with fields of cyclonic and anticyclonic eddies and considerable mixing of water masses between shelf and offshore waters {Brink and Cowles 1991}. Beginning in the fall, and through the winter, the northward flowing Davidson Current is the dominant feature over the shelf and beyond the shelf break {Hickey 1998}.

Current dynamics over the continental shelf are generally forced by regional wind fields, which tend to be southerly in the spring and summer, and northerly in the winter. Spring and summer winds drive offshore Ekman transport of surface waters, which is balanced by the upwelling of deeper waters that tend to be cooler and nutrient rich. Between the Strait of Juan de Fuca and Cape Blanco, summer upwelling leads to the development of a southward flowing upwelling jet over the continental shelf {Hickey 1998, Barth et al. 2000}. The shelf narrows as it approaches Cape Blanco, intensifying the energy of the jet {Bateen 1997, Barth et al. 2000}. As this jet reaches Cape Blanco it turns sharply offshore, mixing the cool, nutrient rich waters of the jet with the warmer, less productive waters of the slow-moving California Current. These interactions lead to the development of eddy fields and mesoscale variability in primary and secondary productivity that distinguish the region south of Cape Blanco from that to the north {Strub et al. 1991}. All these currents, countercurrents, undercurrents, jets and meanders transport water masses of different origins and characteristics, as well as the nutrients and organisms entrained within them, to the California Current System.

Wickett {1967} demonstrated that secondary productivity off southern California was influenced by the advection of northern water from the west wind drift, such that interannual differences in southern Ekman transport explained 50 to 60 percent of the variance in zooplankton biomass. Chelton et al. {1982} followed up these observations by observing that when the bulk of the divergent flow is to the south, the California Current experiences greater southward transport, more productive source waters and higher secondary production in the region off of southern California. Fulton and LeBrasseur {1985} further demonstrated that the zooplankton biomass, and even the mean size of copepods, was greater in the northern portion of the California Current when transport was high. Ongoing research has continued to demonstrate that climate-driven changes in transport and ocean conditions dramatically affect both the species composition and productivity of zooplankton in the northern California Current {Peterson et al. 2002, Peterson and Schwing 2003, Mackas et al. 2004}. Thus, while local wind fields and coastal upwelling ultimately drive much of the primary production at the base of the food web, growing evidence suggests that large-scale physical processes and associated changes in the community composition of zooplankton is a significant factor in determining the overall productivity of the ecosystem {Peterson and Keister 2003, Swartzman and Hickey 2003, Feinberg and Peterson 2003}.

3.1.3 Interannual and Interdecadal Climate Forcing

The effects of climate on the biota of the California Current ecosystem have been recognized for some time. Hubbs {1948} believed so strongly in the correlation between water temperature and fish distributions that he felt “justified in drawing inferences, from the known data on fish distribution, regarding ocean temperatures of the past.” It is worth noting that Hubbs had already drawn distinctions between eras that seemed to be associated with the establishment of warm-water populations over long time periods, and the occasional warm years (generally associated with stronger El Niño events) that brought irregular tropical or subtropical fish much further north along the coast.

Currently, the El Niño/Southern Oscillation (ENSO) is widely recognized to be the dominant mode of interannual variability in the equatorial Pacific, with impacts throughout the rest of the Pacific basin and the globe {Mann and Lazier 1996}. During the negative (El Niño) phase of the ENSO cycle, jet stream winds are typically diverted northward, often resulting in increased exposure of the West Coast of the U.S. to subtropical weather systems. Concurrently, coastally trapped waves propagate the equatorial ENSO signal northward along the West Coast of Central and North America as far as the subarctic, resulting in increased northern advection, warmer sea surface (and subsurface) temperatures, elevated coastal sea levels, and deepened thermoclines {Bakun 1996}. The impacts of these events to the coastal ocean generally include reduced upwelling winds, deepening of the thermocline, intrusion of offshore (subtropical) waters, dramatic declines in primary and secondary production, poor recruitment, reduced growth and survival of many resident species (such as salmon and groundfish), and northward extensions in the range of many tropical species {Wooster and Fluharty 1985, Pearcy and Schoener 1987, McGowan et al. 1998, Pearcy 2002}. There is reduced availability of many forage species, particularly market squid, and juvenile survival of most rockfish is extremely low. Concurrently, top predators such as seabirds and pinnipeds often exhibit reproductive failure.

In addition to interannual variability in ocean conditions, the North Pacific seems to exhibit substantial interdecadal variability. Mantua et al. {1997} first defined what is now commonly referred to as the Pacific (inter)Decadal Oscillation, or PDO, which is defined as the leading principal component of North Pacific (above 20°N latitude) sea surface temperatures between 1900 and 1993, and superficially resembles ENSO over a decadal time scale. During positive regimes, coastal sea surface temperatures in both the Gulf of Alaska and the California Current tend to be higher, while those in the North Pacific Gyre tend to be lower; the converse is true in negative regimes. Evidence suggests that there have been two full PDO cycles in the 20th century. Cool (negative PDO) regimes occurred between 1890 and 1924, and from 1947 to 1976, while warm (positive PDO) regimes from 1925 to 1946 and again from 1977 to 1999. Variation in the productivity of salmon stocks throughout the Northeast Pacific seems to track these changes in ocean temperature, such that positive PDO regimes are associated with increased productivity of salmon stocks from western Alaska to northern British Columbia, and negative regimes favor stocks from California to southern British Columbia {Mantua et al. 1997, Hare et al. 1999}.

Although the precise mechanism for the PDO remains elusive, the pattern is clearly linked to variability in atmospheric conditions. The average wintertime Aleutian low both deepened and moved eastward in the post-1977 regime {Mantua et al. 1997}, resulting in considerably stronger eastward wind stress {Parrish et al. 2001}. This increase in wind stress has been tied to the observed cooling (and increased productivity) of the waters in the central North Pacific[?]and Alaska Gyre {Brodeur and Ware 1992, Polovina et al. 1995}, and the consequent warming of coastal waters in the Gulf of Alaska and California Current {Mantua et al. 1997}. In a more recent effort to quantify the broad scale impacts of the PDO on Northeast Pacific ecosystems, Hare and Mantua {2000} compiled 100 physical and biological time series throughout the Northeast Pacific, including time series of recruitment and abundance for commercially important coastal pelagics, groundfish and invertebrates. They found that the dominant principal component of these 100 time series has the same trajectory as the PDO, consistent with anecdotal accounts of covariance between the PDO and many other physical and biological indices.

Growing evidence also suggests that the PDO may have shifted from a positive to negative regime since 1999, as the period between 1999 and 2002 was associated with a negative PDO signal, cool coastal ocean temperatures, high southward transport, and tremendous salmon productivity {Peterson and Schwing 2003}. However, since that period there has been considerable confusion with respect to whether a shift in the PDO did actually occur, or even whether the PDO remains a dominant mode of variability in North Pacific Climate {Bond et al. 2003, Goericke et al. 2004, Goericke et al. 2005}. The degree to which long-term warming is affecting the world's oceans and its ecosystems relative to other forms of variability is currently a major concern, and the consequent interactions between monotonic (global change), interdecadal (PDO) and interannual (ENSO) climate variability are difficult to disentangle. Although a great many processes drive changes in sea surface temperature trends over multiple time scales, there is growing consensus that the integrated heat content of the global oceans has been increasing, and can only be adequately accounted for by atmospheric forcing attributed to the accumulation of greenhouse gasses in the atmosphere {Levitus et al. 2000; Barnett et al. 2001; 2005}.

Within the California Current itself, Mendelssohn, et al. {2003} described long-term warming trends in the upper 50 to 75 m of the water column using subsurface temperature records in the California Current over the past 50 years. McGowan et al. {1998} attributed significant long term declines in zooplankton populations in the California Current over the same period to increased water temperatures that resulted in an intensification of stratification and a reduction of nutrient regeneration into surface waters. Recent paleoecological studies from marine sediments also indicate that 20th century warming trend in the California Current have exceeded natural variability in ocean temperatures over the last 1400 years {Field et al. 2006a}. All of this evidence suggests that although the development of statistical indices of climate variability across multiple time scales have improved our understanding of how climate has affected North Pacific ecosystems and productivity in the past, the future remains subject to extremely poor predictability.

3.1.3 Biogeography

Biogeography describes spatial patterns of biological distribution. Along the U.S. West Coast within the California Current system, such patterns have been observed to be influenced by various factors including depth, ocean conditions, and latitude. Each are discussed in the remainder of this section.

At the scale of the ecosystem, the most widely recognized patterns are distinct zoogeographic provinces extending North and South of Point Conception, California, known as the Oregonian and San Diego Provinces. The Oregonian Province extends from the Straight of Juan de Fuca in the North to Point Conception in the South. The San Diego Province begins at Point Conception and runs south past the terminus of the EEZ {NMFS 2004 OLO}.

Patterns of adult groundfish distribution based on depth have been observed to occur between nearshore, continental shelf, and the continental slope and have been used to form discrete management units. This information is detailed in (INSERT SECTION). Botsford and Lawrence {2002} showed considerable spatial and temporal synchrony in coho salmon and Dungeness crab catches among ports and regions in the California Current between 1950 and 1990; interestingly, they also found that Chinook landings did not have spatial coherence. Similarly, Field and Ralston {2005} showed that 51-72 percent of the year-to-year variability in recruitment for three winter spawning rockfish (yellowtail, widow and chilipepper) seems to be shared coastwide, over a spatial scale of 500-1,000 km. The major differences in recruitment strength seemed to be associated with Cape Blanco and/or Cape Mendocino, and some evidence suggests differences in relative year class strength north and south of Point Conception as well. With respect to genetic evidence for biogeographic boundaries, Hedgecock {1994} found that fish and invertebrates with planktonic larvae generally maintain low spatial genetic variance over large (500-2000 km) regions in the California Current. Analysis of a range of *Sebastes* species also suggests little genetic differentiation within the California Current region {Wishard et al. 1980; McGauley and Mulligan 1995; Rocha-Olivares and Vetter 1999}, although some nearshore species may exhibit greater spatial patterns of population substructure, particularly north and south of Cape Mendocino {Cope 2004}.

Williams and Ralston {2002} found that Cape Mendocino (and the Mendocino Escarpment) was one of the most noteworthy barriers to the latitudinal distribution of rockfish species diversity. Most stock assessments for groundfish tend to be either coastwide assessments, or are relative to the stocks north or south of Cape Mendocino (occasionally Cape Blanco). Both Cape Mendocino and Point Conception are key management boundaries for the Council. In general, evidence suggests wide to very wide dispersal of larvae and juveniles for most groundfish, with modest to limited movement of adults (general on the scale of thousands of kilometers for most species, with limited examples of small numbers of some populations moving in the hundreds of kilometers). There are strong seasonal inshore and offshore migrations for many species, particularly flatfish, and some evidence for ontogenetic movement in some species by both/either depth and latitude. Pacific hake are the only confirmed highly migratory groundfish species in the FMP, with a clear seasonal migration from southern spawning grounds off of northern Mexico and Southern California to northern foraging habitat off of Oregon, Washington, and British Columbia {Bailey et al. 1982}. There is an ontogenetic component to this migration, as juveniles tend to be found off of central and northern California, with larger, older fish tending to travel further north. Similarly, the distribution of hake tends to be more northerly in warm years {Dorn 1995, Swartzman and Hickey 2003}, reflecting interannual shifts in marine habitat conditions.

While the physical and bathymetric features associated with these general biogeographic boundaries are fixed in space, the physical characteristics of water masses and associated plankton communities are clearly highly dynamic in space and time (as discussed in sections 3.1.2 and 3.1.3). Fulton and LeBrasseur {1985} described a transport-driven shifting subarctic domain in the northern reaches of the California Current System, the margin of which was characterized by abrupt declines in zooplankton biomass south of the subarctic boundary. Although the physical dynamics are now thought to be more complex than their model, it is clear that climate driven changes in transport and ocean conditions dramatically alter both the species composition and productivity of zooplankton throughout the California Current to a considerably greater extent than static boundaries based on geography {McGowan et al. 1998, Peterson et al. 2002, Peterson and Schwing 2003; Mackas et al. 2004}.

For example, in the late 1960s and early 1970s, the dominant copepod species in the Northern California Current during the summer tended to be subarctic (or boreal) types such as *Pseudocalanus mimus*, *Calanus marshallae* and *Arcatioa longiremis*; species that are commonly found over shelf waters throughout the Gulf of Alaska {Peterson and Miller 1977}. Data suggest that northern species became relatively less abundant, while southern (subtropical) species such as *Paracalanus parvus* and *Calanus pacificus* were more abundant through the 1980s and early 1990s. These southern species were almost completely dominant during the 1997-98 El Niño, at which time standing biomass was near all time lows {Peterson et al. 2002}. Since 1999, northern species have again dominated numerically during spring and summer, and the standing biomass of zooplankton has been roughly double that observed prior to 1999 {Peterson and Schwing 2003}.

3.1.4 Essential Fish Habitat

Essential Fish Habitat (EFH) has been described within the project area for highly migratory species, coastal pelagic species, salmon, and groundfish. The MSA defines EFH to mean "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (16 U.S.C. 1802 sec. 3(10)). Regulatory guidelines elaborate that the words "essential" and "necessary" mean EFH should be sufficient to "support a population adequate to maintain a sustainable fishery and the managed species' contributions to a healthy ecosystem." The regulatory guidelines also establish authority for Councils to designate Habitat Areas of Particular Concern (HAPC) based on the vulnerability and ecological value of specific habitat types. Councils are required to minimize to the extent practicable the adverse of fishing on EFH. NMFS works through a consultation process to minimize adverse effects of non-fishing activities (50 CFR 600 subpart J).

3.1.4.1 Coastal Pelagic Species

The coastal pelagic species (CPS) fishery includes four finfish (Pacific sardine, Pacific (chub) mackerel, northern anchovy and jack mackerel), and market squid. CPS finfish generally live nearer to the surface than the sea floor. The definition of EFH for CPS is based on the temperature range where they are found, and on the geographic area where they occur at any life stage. This range varies widely according to ocean temperatures. The EFH for CPS also takes into account where these species have been found in the past, and where they may be found in the future.

The east-west boundary of EFH for CPS includes all marine and estuary waters from the coasts of California, Oregon, and Washington to the limits of the EEZ (the 200-mile limit) and above the thermocline where sea surface temperatures range between 10 and 26 °C. (A thermocline is an area where water temperatures change rapidly, usually from colder at the bottom to warmer on top). The southern boundary is the U.S.-Mexico maritime boundary. The northern boundary is more changeable, and is defined as the position of the 10° C isotherm, which varies seasonally and annually. (The 10° C isotherm is a rough estimate of the lowest temperature where finfish are found, and thus represents their northern boundary). In years with cold winter sea surface temperatures, the 10° C isotherm during February is around 43° N latitude offshore, and slightly further south along the coast. In August, this northern boundary moves up to Canada or Alaska. A more complete description of Coastal Pelagic Species and associated EFH is contained in the Coastal Pelagics FMP, which is incorporated herein by reference.

3.1.4.2 Salmon

Salmon range from more than 1,000 miles inland to thousands of miles out at sea. Although the waters off Canada are salmon habitat, they are also not included in the description of salmon EFH because they are outside of U.S. jurisdiction. However, waters off Alaska are included in the description.

In estuaries and marine areas, salmon habitat extends from the shoreline to the 200-mile limit of the EEZ and beyond. In freshwater, salmon EFH includes all the lakes, streams, ponds, rivers, wetlands, and other bodies of water that have been historically accessible to salmon. The description of EFH also includes areas above artificial barriers, except for certain barriers and dams that fish cannot pass. However, activities that occur above these barriers and that are likely to affect salmon below the barriers may be affected by court rulings from ongoing EFH-related litigation.

The Council is required to minimize the negative impacts of fishing activities on essential salmon habitat. The ocean activities that the Council is concerned with include the effects of fishing gear, removal of salmon prey by other fisheries, and the effect of salmon fishing on reducing nutrients in streams due to fewer salmon carcasses in the spawning grounds. The Council may use gear restrictions, time and area closures, and harvest limits to reduce negative impacts on salmon EFH.

The Council is also required to comment and make recommendations regarding other agencies' actions that may effect salmon EFH. This usually takes the form of endorsing an enhancement program or other type of program, requesting information and justification for actions that might effect salmon habitat, and promoting the needs of the salmon fisheries. The Council works with many other agencies to identify cumulative impacts on salmon habitat, to encourage conservation, and to take other actions to protect salmon habitat. A more complete description of Salmon and associated EFH is contained in the Salmon FMP, which is incorporated herein by reference.

3.1.4.3 Highly Migratory Species

These species (tuna, swordfish and sharks) range widely in the ocean, both in terms of area and depth. Highly migratory species (HMS) are usually not associated with the features that are typically considered fish habitat (such as seagrass beds, rocky bottoms, or estuaries). Their habitat may be defined by temperature ranges, salinity, oxygen levels, currents, shelf edges, and sea mounts. Little is known about why highly migratory species frequent particular areas. Nevertheless, these species may be affected by actions close to shore or on land, such as fishing, dredging, wastewater discharge, oil and gas exploration and production, aquaculture, water withdrawals, release of hazardous materials, and coastal development. A more complete description of HMS and associated EFH is contained in the HMS FMP which is incorporated herein by reference.

3.1.4.4 Groundfish

The Council first identified groundfish EFH in 1998 via Amendment 11 to the FMP. Because information about each groundfish species' habitat was limited, EFH was defined as the whole West Coast Exclusive Economic Zone. However, in 2000, based on the *American Oceans Campaign* v. *Daley* court case, the Council was directed to revisit the question of groundfish EFH. In 2001, NMFS Northwest Region staff began work on an environmental impact statement (EIS) for groundfish EFH off Washington, Oregon, and California, which after several years of work was finalized in 2005. The Council's preferred alternative in the final EIS became Amendment 19 to the Groundfish Fishery Management Plan in 2006.

EFH for groundfish is described as all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth. "Habitat areas of particular concern," or HAPCs, are a subset of EFH used to focus management and restoration efforts. The current HAPC types are: estuaries, canopy kelp, seagrass, rocky reefs, and "areas of interest" (a variety of submarine features, such as banks, seamounts, and canyons, along with Washington State waters.) (INSERT FIGIRE)

In addition to identifying EFH and describing HAPCs, the Council also adopted mitigation measures directed at the adverse impacts of fishing on groundfish EFH. Principal among these are closed areas to protect sensitive habitats. There are three types of closed areas: bottom trawl closed areas, bottom contact closed areas, and a bottom trawl footprint closure. The bottom trawl closed areas are closed to all types of bottom trawl fishing gear. The bottom trawl footprint closure closes areas in the EEZ between 1,280 m (700 fm) and 3,500 m (1,094 fm), which is the outer extent of groundfish EFH. The bottom contact closed areas are closed to all types of bottom contact gear intended to make contact with bottom during fishing operations, which includes fixed gear, such as longline and pots. A more complete description of groundfish and associated EFH is contained in the Groundfish FMP, which is incorporated herein by reference.

3.1.5 Marine Protected Areas

In addition to the closed areas described above, there are marine protected areas distributed throughout the project area. The EIS for Pacific Coast Groundfish EFH contains a complete analysis of these sites and is incorporated here by reference. The following is a brief summary of these areas.

Federally designated marine managed areas:

- Twenty-eight National Wildlife Refuges, covering approximately 89,000 ha. Regulations vary by refuge, but generally, commercial fishing is not allowed in most refuges.

- Seven National Parks, covering approximately 570,000 ha (although only a small fraction of this area is the marine portion of the parks). Regulations vary by park.

- Five National Marine Sanctuaries covering approximately 3,000,000 ha. Regulations vary by sanctuary, but in general, all types of fishing are allowed in federal waters of the sanctuaries.

- Four National Estuarine Research Reserves (NERR), covering approximately 8,000 ha. All fishing and fishing gear are prohibited from the Tijuana River NERR and the Elkhorn Slough NERR (which doesn't include the Slough's main channel). All other NERR sites allow or do not address specific fishing regulations.

Other Federal Areas:

These are some additional areas under federal jurisdiction that may have restrictions to vessel access, rather than specific regulations having to do with fishing or fishing gear. These data were developed in 1998 by Al Didier for the Pacific States Marine Fisheries Commission (PSMFC), so the total number of areas may have changed since these data were compiled.

- Twenty-two Regulated Navigation Areas (33CFR165) cover approximately 17,000 ha, and are located generally in urban areas such as Puget Sound, Columbia River, San Francisco Bay, Los Angeles, and San Diego.

- Forty-nine Danger Zones and Restricted Areas (33CFR334) cover approximately 170,000 ha. These are located in Puget Sound, San Francisco Bay, Monterey Bay, between Morro Bay and Point Conception, off some of the Channel Islands, and a few additional southern California locations.

- Twenty-seven weather and scientific buoys. Two buoys are located off the Washington coast, one is located off the Oregon coast, twenty buoys are located off the California coast, with six of these located off Monterey Bay. Four of these buoys are located outside the EEZ.

Fishing regulated areas established by the Pacific Fishery Management Council:

- Rockfish Conservation Area (RCA): These areas have changed over time, as well as having a seasonal component to their locations. In addition, there are specific areas for trawl gear and non-trawl gear. Not all of the historical RCA areas have been developed into GIS data, but most of the areas from 2003 are mapped as an example (Figures 3-20 through 3-25). A chronology of changing trawl and non-trawl RCAs for the year 2003 is included below.

- Cowcod Conservation Areas (CCA): Sections of the CCA cover a total area of 1,372,447 ha (Figure 3-26).

- Darkblotched Conservation Area (DBCA): The Dark Blotched Conservation Area covered 1,029,415 ha (Figure 3-26).

- Yelloweye Rockfish Conservation Area (YRCA): This area encompasses 59,285 ha (Figure 3-26).

- Two National Marine Fisheries sites (Pacific Whiting Salmon Conservation Zones), covering approximately 44,000 ha. These two sites, one off the Columbia River and one off the Klamath River, prohibit fishing for Pacific Whiting with commercial mid-water trawl gear.

Trawl RCA Chronology:

- April 2003: 2,380,610 ha.

- May 2003: 5,530,861 ha; North of 40°10’ N latitude, the eastern boundary moved to shore. Other boundaries same as April.

- June 2003: 3,850,239 ha; South of 40°10’, the western boundary was moved further west. North of 40°10’, the eastern boundary moved away from shore to a location between the April’s eastern boundary and May’s eastern boundary.

- July–August 2003: 2,865,640 ha; North of 40°10’, the eastern boundary was moved away from shore.
- September–October 2003: 3,592,844 ha.
- November 2003: 3,590,423 ha.

Non-Trawl RCA Chronology:

- April 2003: 4,864,260 ha.
- May 2003: 4,864,260 ha; same boundaries as April 2003.
- June 2003: 4,864,491 ha; same depth boundaries as May 2003 with a small change in coordinate locations.
- July–August 2003: 4,855,405 ha; same boundaries as June 2003, with modification in southern California for Newport/South Jetty open area.
- September–October 2003: 4,956,611 ha; south of Point Conception, eastern boundary moved towards slightly towards shore. Additional areas added around Channel Islands.
- November 2003: 4,956,611 ha; same area as September–October.

State marine protected areas:

California: MPA boundaries for sites in California were downloaded from the California Department of Fish and Game website. In these data, there are 79 sites covering approximately 59,000 hectares. The California sites have been categorized into 13 designations. California is currently renaming and recategorizing these sites into three designations (marine reserve, marine park, and marine conservation area); however, the existing designations are used here for descriptive purposes (Figure 3-27).

- Ten State Marine Reserves: These areas are located adjacent to the Channel Islands. No commercial or recreational fishing is allowed in these areas.
- Two State Marine Conservation Areas: These areas are also located adjacent to the Channel Islands. Most commercial fishing, except for spiny lobster fishing, is prohibited in these areas.
- Seven State Parks: five of these coastal state parks are located north of San Francisco, one is south of Monterey, and one is near Irvine. Fishing regulations vary by park.
- Four State Beaches: One is located north of San Francisco and the other three are south of Point Conception. Fishing regulations vary by site.
- One State Historic Park: This site is located north of San Francisco. There are no prohibitions on fishing gear of any type.
- Nine Reserves: Several areas in, near or north of San Francisco Bay. A few areas in southern California. Regulations are highly variable by site—some prohibit all fishing, and some allow all fishing.

- Twenty-two Ecological Reserves: These sites are located all along the coast. Regulations are highly variable by site—some are designated as no-take reserves, meaning all fishing is prohibited, and some are designated to prohibit certain type of fishing. Some allow all fishing, but prohibit take of other types of resources.

- Four MRPA Ecological Reserves: three sites are located along the central California coast, and one is north of San Francisco. Recreational and commercial fishing is prohibited at all sites.

- One Invertebrate Reserve: This site is located on the central coast. Recreational fishing is allowed for finfish. Commercial fishing is allowed for finfish, lobster, abalone and crab.

- One Natural Preserve: This site is located in northern California. No access allowed to the site.

- Three Clam Preserves: These sites are located on the central coast, just north of Point Conception. No clams may be taken, but all commercial and recreational fishing and fishing gear are allowed.

- One Marine Gardens Fish Refuge: This site is located in Monterey Bay. Most commercial fishing gear is prohibited, except nets. Recreational pot gear is prohibited, other recreational gear is allowed.

- Fourteen Marine Life Refuges: These sites are located primarily along the central and southern coast. Most commercial gear, except pot and "other" gear, is prohibited from these sites. All recreational gear types are allowed.

Oregon: MPA boundaries for three types of sites in Oregon were provided by Oregon Department of Fish and Wildlife. These are all small intertidal sites encompassing approximately 460 ha (Figure 3-31).

- Seven Marine Gardens: Generally, commercial and recreational pot gear is prohibited, other gear types not restricted.

- Six Research Reserves: Generally, commercial pot gear is prohibited

- One Habitat Refuge: All commercial and recreational fishing activities are prohibited.

Washington: The Washington State GIS data for MPAs contain 68 individual sites covering approximately 28,000 ha. The areas are managed by one of the following organizations: WDFW, Washington Department of Natural Resources (WDNR), San Juan County Marine Resource Committee (MRC), Washington State Parks and Recreation Commission (WSPRC), or The Nature Conservancy (TNC). The total area figure is a bit of an overestimate because some of the areas, such as state parks and TNC areas, include the upland portions of the sites as well as the marine portions (Figures 3-32 and 3-33).

- Nine WDFW Marine Preserves: generally prohibit most types of commercial fishing gear.

- Two WDFW Wildlife Refuges; generally closed to all access.

- Nine WDFW Conservation Areas: most restrictive of fishing—all fishing and gear are prohibited from nearly all of these sites.

- Two WDFW Sea Cucumber Closures: closed to commercial harvest of sea cucumbers and urchins.

- Six WDNR Aquatic Reserves: no restrictions on commercial or recreational fishing

- Seven WDNR Natural Areas Preserves: highest level of restriction–only allowable activities are scientific or education functions. Therefore, no commercial or recreational fishing allowed.

- Two WDNR Natural Resource Conservation Areas: No specific prohibition of fishing activities.

- Eight San Juan County MRC Bottomfish Recovery Zones: These are voluntary bottomfish no-take zones–no specific prohibition of fishing activities.

- Seven State Parks: Prohibited to take non-game invertebrates and seaweed. No specific prohibition of fishing activities.

- Two TNC Conservation Easements.

- Fourteen TNC Nature Preserves: limitation on public access and all fishing activities.

3.1.6 The Role of Rebuilding Species in the Marine Ecosystem

Under Section 304 of the Magnuson-Stevens Fishery Conservation and Management Act (104-297), fishery management plans, plan amendments, or proposed regulations for overfished species must take into account status and biology of any overfished stocks of fish as well as the interaction of overfished stocks within the marine ecosystem. This section was developed to consider the relevant aspects of these stocks with respect to their interaction with other biotic elements of the ecosystem.[12] The intent is not to replicate the evaluation of status, life history, and productivity of the stocks themselves, which is discussed in more detail in Chapters 2 and 4, but rather to focus on the role of these species in the environment, and to attempt to evaluate the relative impacts of alternative management decisions analyzed in this document with respect to the long-term consequences on other elements of the ecosystem (noting that the likely or expected impacts on the stocks themselves are discussed in detail in the stock-specific summaries in Chapter 4).

The rebuilding rockfish stocks, and indeed all rockfish more generally, occupy a broad range of ecological niches and trophic roles, and some analysis of their principal predators, prey, and competitors is an important consideration with respect to the impacts that rebuilding decisions may have on the larger ecosystem. Larval rockfish (and larval fish more generally), have been shown to play a minor role in the macrozooplankton community, which is dominated by a wide range of predators and competitors {McGowan and Miller 1980}. However, both juvenile and adult rockfish are important prey items to a wide range of other rockfish, other piscivorous fishes, seabirds, and marine mammals. Most food habits studies do not reliably or consistently report rockfish to the species level. Therefore, a summary of key predators here is focused more generally the role of rockfish as prey, rather than the

[12] Many marine organisms (such as many types of plankton, structure-forming invertebrates, and burrowing or bioturbating organisms) can and do interact with abiotic (physical and chemical) characteristics of an ecosystem that could have broader-scale impacts to marine communities and ecosystems. However, such interactions are neither known nor suspected for the rebuilding species evaluated in this section, and consequently are not explicitly considered here.

role of individual rebuilding species as prey. Although it is not possible to assess potential impacts to predators that may or may not result from the depletion of rockfish populations, particularly with respect to the level of depletion beyond target levels or the natural population variability exhibited by unfished species {Moser et al. 2000; Miller and Sydeman 2004}, it is clear that rockfish in general (particularly juveniles) represent a significant trophic linkage throughout the ecosystem.

For example, Merkel {1957} reported that juvenile rockfish were particularly important prey of Chinook salmon along the central California coast, representing on the order of 22 percent of prey by volume throughout the year, with most predation occurring between May and July, when pelagic juveniles move inshore to settle. Brodeur and Pearcy {1990} also found heavy predation on larval and juvenile rockfish by coho and Chinook salmon along the Oregon and southwest Washington coasts. The importance of rockfish as prey to piscivorous rockfish such as bocaccio, cowcod and yelloweye is summarized below; many nearshore rockfish species also predate heavily on other rockfish, particularly juveniles {Lea et al. 1999; Hobson et al.; Love et al. 2002}. Lingcod are among the most voracious predators of both juvenile and adult rockfish; Phillips {1959} reported that a 54-lb lingcod in Monterey, California had been found with a 12-inch starry rockfish and an 18½-inch canary rockfish in its stomach. Additional studies have confirmed that rockfish are important prey items for both California {Shaw et al. 1989} and Oregon lingcod {Steiner 1979}. Sablefish are also significant predators of both juvenile and adult rockfish, with rockfish representing between 20 and 60 percent of sablefish prey by volume {McFarlane and Beamish 1983; Cailliet et al. 1988; Laidig et al. 1997; Buckley et al. 1999}. However, for most depth ranges sablefish prey primarily on longspine thornyheads. Although Pacific hake are known predators of juvenile rockfish, juvenile rockfish represent significantly less than 1 percent of their diet by both volume and frequency of occurrence. Pacific halibut, soupfin sharks, dogfish sharks, and albacore tuna are other known rockfish predators {Rankin 1915; Ripley 1946; Bonham 1954}, and many other fishes are likely to feed on rockfish (particularly juveniles) as well.

A wide range of seabirds also prey heavily on juvenile rockfish {Wiens and Scott 1975, Chu 1984}. For many species, as much as 90 percent of their diet comprises juvenile rockfish during the late spring and early summer, which coincides with the breeding season for many resident species {Ainley et al. 1993, Miller and Sydeman 2004}. However, there is considerable interannual, and interdecadal variability in the frequency of rockfish in seabird diets, related primarily to the availability of juveniles to seabirds. While many studies have not attempted to identify juvenile *Sebastes* to species, for those that have (largely off of the central and southern California coasts,) unexploited species such as shortbelly rockfish generally account for more than two-thirds of the juvenile rockfish identified {Merkel 1957, Ainley et al. 1996, Miller and Sydeman 2004}. Throughout the 1990s, declines in juvenile rockfish predation by central California seabirds occurred in both exploited and unexploited rockfish species {Sydeman et al. 2001, Miller and Sydeman 2004, Mills et al. in press}. It is reasonable to expect that fisheries removals have contributed to overall declines in juvenile production, with proportionately greater declines in production for stocks that have been historically overfished and are now rebuilding.

As seabirds have a success-failure breeding response, rather than a response that is proportional to food supply, there is a potential for seabird populations to be highly sensitive to changes in food abundance {MacCall 1984; Furness and Tasker 2000; Sydeman et al. 2001}. This may be particularly true for seabirds in which juvenile rockfish have been shown to be a preferred prey item. Research has shown that common murres prefer to forage locally for juvenile rockfish during their breeding season (May-June, when juvenile rockfish are most abundant), since the close proximity to the breeding grounds reduces foraging trip duration. In years when juvenile rockfish are less abundant, murres forage in coastal waters for northern anchovy and other forage fishes {Ainley and Boekelheide 1990, Miller and Sydeman 2004}. Consequently, it is difficult to determine whether declines in overfished species could have had a notable impact on seabird reproductive success or other predators above and beyond that which has occurred as a result of fishing stocks to target levels and natural variability. These declines are coincident with the poor recruitment observed in many exploited species (described in section **4.2.XX**), as well as poor reproductive performance for many seabird species that depend heavily on juvenile rockfish in the breeding season (Sydeman et al. 2001). However, the observation that declines were observed in the consumption by seabirds of juveniles of both unexploited and exploited species suggests that ocean conditions were a major factor in the low abundance of juvenile rockfish.

Both juvenile and adult rockfish are typically a modest, but significant, component in the diets of most California Current pinnipeds and many cetaceans; however, rockfish prey are rarely identified to the species level {Morejohn et al. 1978; Stroud et al. 1981; Perez and Bigg 1986}. Morejohn et al. {1978} did identify bocaccio rockfish to species in diets of harbor seals and elephant seals, but other rockfish were listed solely as *Sebastes sp*. Lowry and Carretta {1999} reported that shortbelly rockfish were among the most frequently encountered prey items for California sea lion at San Nicolas, San Clemente, and Santa Barbara Islands. Lowry et al. {1991} also suggested that California sea lion food habits tend to be temporally dynamic and related to the relative availability of prey. Off of central California, some rockfish taken in food habits studies have been identified using otoliths, with those identified to species including shortbelly, bocaccio, splitnose, vermillion, and canary rockfish.[13]

Given that most marine mammal populations in the California Current exhibit either stable or increasing abundance trends over the last several decades, it seems unlikely that the depletion of overfished rockfish or any alteration to their expected recovery trajectories that might result from management decisions would have a negative impact on marine mammals. However, the converse situation, in which increasing marine mammal populations might slow or prevent the recovery of rebuilding species (a depensatory impact), may be plausible. For example, Bundy {2001} used a multispecies model of the Newfoundland-Labrador ecosystem to evaluate such potential interactions between harp seals and cod. Her results suggest that although the decline of cod was the result of overfishing, the recovery may be hindered by the increasing natural mortality rate associated with a nearly constant per capita consumption of cod by harp seals and concurrent increases in seal abundance. Such factors, which are know as depensatory processes that could complicate recovery efforts for some species, are difficult to quantify, and consequently are not explicitly considered in the analysis of rebuilding trajectories. However, since most rockfish are characterized by low growth, low metabolic rates, and low natural mortality rates, they are likely to be less tightly coupled with the dynamics of either their predators or their prey over most temporal and spatial scales.

With respect to the food habits of the depleted species themselves, accurate quantification of food habits is poor. Most rockfish are notoriously difficult to sample for food habits studies due to the eversion of their air bladder upon capture in sampling gear, usually resulting in regurgitation of any stomach contents. Thus, while several quantitative studies exist for widow, canary, yelloweye, and darkblotched rockfish, anecdotal accounts of food habits are the primary source of information for cowcod and bocaccio rockfish. For all of these species, general patterns of prey preferences are evident from the literature; however, prey preferences may also vary substantially over time (seasons, years), space (depth, latitude, habitat) and life history stage (most species tend to exhibit some ontogenetic shift in prey preferences with size).

Available food habits studies tend to confirm that POP, darkblotched, canary, and widow rockfish are primarily planktivorous, with the vast majority of the diets of the first three of these being euphausiids. For example, Brodeur and Pearcy {1984} found that euphausiids comprised 85 percent of prey by volume for Pacific Ocean Perch, 92 percent by volume for Canary rockfish, and roughly 75 percent by

[13] M. Weise, University of California Santa Cruz, unpublished data, but see Weise and Harvey {2005} for an overview of the study and methods.

volume (of identifiable remains) for a small number of darkblotched rockfish (for which most prey remains were unidentifiable). All three of these species also fed to some extent on smaller amounts of pelagic shrimp, cephalopods, mesopelagic fishes, and other prey. Lee {2002} also found that canary rockfish relied heavily on euphausiids, which accounted for over 98 percent of prey by volume. By contrast, widow rockfish have a more varied range of prey items, including a heavy reliance on gelatinous zooplankton. Phillips {1964} reported that widow rockfish, which tend to occupy semi-pelagic habitat, feed on macrozooplankton, particularly amphipods. Adams {1987} found that widow rockfish diets in northern California were dominated by four key groups of prey items; salps and other gelatinous zooplankton, euphausiids, pelagic shrimp, and small fishes (primarily mesopelagic fishes, juvenile hake, and forage fishes such as anchovy and smelt). Lee {2002} found that nearly 75 percent of the diet by volume of widow rockfish off of Oregon and Washington was composed of salps and other gelatinous predators, with smaller fractions of euphausiids, pelagic shrimps, and small fishes.

Although quantitative food habits studies do not exist for either cowcod or bocaccio rockfish, both Phillips {1964} and Love, et al. {2002} described bocaccio rockfish as almost exclusively piscivorous. Love, et al. {2002} include other rockfish, hake, sablefish, anchovy, mesopelagic fishes, and squid as the key prey for large juvenile and adult bocaccio, while cowcod are described by Love et al. {2002}as feeding on "anything that is not bolted down," but primarily fishes and cephalopods. Limited data is reported in the literature for yelloweye rockfish. Steiner {1979} reported on the stomach contents of 28 yelloweye caught on rocky reefs off of the central Oregon coast, which preyed primarily on benthic epifauna, flatfish, other rockfish and shrimp. Rosenthal, et al. {1987} found that yelloweye rockfish in southeast Alaska were primarily piscivorous, preying primarily on herring, other rockfish, and sand lance. Thus, the general patterns that emerge for these seven species are that three are higher trophic level piscivores that tend to be found on rocky or highly structured habitat (cowcod, bocaccio, and yelloweye rockfish), three are primarily planktivores associated with shelf and slope benthic habitat (POP and canary and darkblotched rockfish) and one is an omnivorous species that occurs and feeds primarily in midwater, and primarily on gelatinous zooplankton (widow rockfish).

As higher trophic level predators, cowcod, bocaccio, and yelloweye rockfish have a greater potential to play a structuring role in the ecosystem, particularly over smaller spatial scales. Despite their overall rarity throughout the marine environment relative to more abundant omnivorous or planktivorous rockfish,[14] submersible surveys have found that these piscivorous species can be found at relatively high levels of abundance in many rocky reef habitats isolated and presumably lightly fished reefs {Yoklavich et al. 2000, Yoklavich et al. 2002, Jagielo et al. 2003}. In surveys of reefs that had high piscivores density, the concentration of smaller, fast-growing and early maturing *Sebastes* species was considerably lower (such as greenstripe, rosethorn, splitnose, and pygmy rockfish). By contrast, in rocky reef habitats known or suspected to be subject to heavier fishing pressure, the abundance of such small, fast-growing, and early-maturing species was considerably greater. For example, Stein et al. {1992} found that reefs with small numbers of piscivorous rockfish (such as yelloweye) had very high numbers (as much as three orders of magnitude greater) of smaller species. Yet the scarcity of data on spatial patterns of abundance and fishing pressure, and a lack of all but qualitative food habits data for most these species, makes demonstrating and quantifying such interactions extremely challenging.

Additional empirical support for either intraguild competition or top-down impacts of fishing that may

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[14] Estimates of unfished biomass (B_0) for cowcod and yelloweye are on the order of 3,000 and 7,500 mt respectively. By contrast, estimates of unfished biomass for bocaccio and widow and canary rockfish are on the order of 70,000, 90,000, and 230,000 mt respectively. Similarly, cowcod have always been among the rarest of *Sebastes* spp. larvae identifiable to species in the standard CalCOFI survey area (nearshore to offshore waters south of Point Piedras Blancas off California) between 1951 and 1998, with estimates of abundance as much as two orders of magnitude less than more abundant species {Moser et al. 2000}.

have resulted in either localized or large-scale community changes is presented in Levin, et al. {in press}, who found some evidence for broad-scale changes in the taxonomic composition of benthic marine fishes in the California Current. Their analysis focused on 16 species of rockfish, eight species of flatfish, and seven species of cartilaginous fishes that were sampled by bottom trawl surveys on the continental shelf between 1977 and 2001 (including all of the rebuilding species except for cowcod). For the species they included in their analysis, rockfish declined from over 60 percent of the catch in 1977 to less than 17 percent of the catch in 2001, with flatfish catches increasing by a similar magnitude. Additionally, populations of larger rockfish (including primarily the rebuilding species) had fallen at high rates (as reflected by stock assessments), while those of smaller species, particularly those associated with soft substrate, had generally increased in abundance. These authors also note that the potential for smaller species of rockfish to consume or outcompete recruiting juveniles of larger species highlights the potential that fishing could shift the community composition of the rockfish assemblage, or the benthic groundfish assemblage more generally, into an alternate state.

The potential for intraguild competition or top-down forcing, in both small-scale rocky reef systems and throughout the larger ecosystem, is also supported by theoretical considerations and simulation models. Walters and Kitchell {2001} as well as MacCall {2002} have demonstrated the potential for strong interactions among the adults of higher trophic level piscivores and their prey, such that adults crop down forage species that may be potential predators or competitors of their own juveniles, with consequent negative impacts on higher trophic level predators when their populations are reduced by fishing {see also Swain and Sinclair 2000}. Baskett et al. {2006} have explored the potential for such interactions as well, with a community interactions model based on rocky reef habitat and juvenile and adult life history stages of rockfish parameterized to represent yelloweye and pygmy rockfish. Their model sought to evaluate interspecific dynamics among rocky reef rockfish within a marine reserve, and considered the interactions among fishing, population recovery following cessation of fishing mortality, juvenile predation and competition.

Without interspecific interactions, the model developed by Baskett, et al. {2006} predicted that larger piscivores would recover given minimal levels of dispersal and reserve size. However, when community interactions were taken into account, initial conditions such as the relative abundance of the piscivores and the size of the reserve became more important with respect to the ultimate stable state, and the models predicted that under some circumstances recovery could be unlikely. Due to lack of adequate information on abundance and plausible parameter values for many of the interactions, the model was simplistic in the sense of modeling a single predator (with two life history stages) and a single prey/competitor, with little evaluation of the complicating impacts of climate variation, variability in recruitment, multiple alternative prey items, and other factors. Despite this, their results were consistent with similar simulations of the potential consequences of community interactions in marine systems {Walters and Kitchell 2001, MacCall 2002, Mangel and Levin 2005}, and speak to the importance of considering such interactions in the design, implementation and monitoring of recovery efforts for rebuilding species.

3.2 Criteria Used to Evaluate Impacts

3.2.1 Discussion of Direct and Indirect Impacts

The sections above provide a conceptual framework, based on trophic considerations and the basic structure and function of marine food webs, for considering the plausible impacts of the removal of both overfished (rebuilding) stocks as well as healthy stocks from the marine ecosystem. The impact associated with both the status quo and the action alternatives are the removals of these species from the ecosystem, at various levels depending upon the OY alternatives. Biogeography and EFH are presented for consideration of other elements of the ecosystem along with current measures to protect EFH.

Although far from conclusive, the empirical evidence and theoretical considerations discussed in section 3.1.3 suggest some potential for top-down impacts or intraguild competition, as a result of declines in higher trophic level species such as cowcod, bocaccio, and yelloweye rockfish over small spatial scales. It is reasonable to expect that similar impacts could potentially be associated with fishery-induced declines in stocks of healthy species (those reduced from their equilibrium abundance, but not to levels below overfishing limits), such as sablefish, Pacific halibut, petrale sole, shortspine thornyhead, Pacific hake, and other piscivorous or higher trophic level species. Such impacts are often referred to as trophic cascades, in which declines of high trophic level species (keystone predators) have cascading impacts through food webs to the abundance, productivity, and species diversity of lower trophic levels. Empirical examples of trophic cascades tend to be more common for semi-enclosed ecosystems such as lakes, or highly structured (two dimensional) environments, such as intertidal or sub-tidal ecosystems {Paine 1969, Simenstad et al. 1978, Tegner and Dayton 2000}. As one ventures further from these environments, the evidence for top-down control, or trophic cascades, becomes considerably spottier, although Van der Elst {1979} reported a classic example of top-down control of a coastal ecosystem off of the Natal coast in South Africa.[15]

However, in coastal upwelling ecosystems such as the California Current, most evidence suggest that the primary forcing factor for ecosystem productivity and structure over the scale of the entire system tends to be either "bottom-up" (based on the amount and variability of primary or secondary production) or "middle-out." For example, Ware and Thomson {2005} proposed that the carrying capacity of north Pacific coastal ecosystems was primarily determined by bottom-up control, based on correlations between latitudinal variability in primary production and commercial fisheries yields. Alternatively, bottom-up control in these ecosystems could be a function of secondary production, through variability in the productivity and species composition of the zooplankton community. As discussed in section 3.1.1, the California Current seems to experience higher secondary production during periods of stronger southward transport and cooler sea surface temperatures. Zooplankton, particularly euphausiids, are the principal prey item for most of the mid-trophic level organisms in the California Current, including Pacific hake and most rockfish.

An alternative to bottom-up control is "middle-out" control, also referred to as "wasp-waist" control, in which a small number of key mid-trophic level species represent a bottleneck of energy flow between lower and higher trophic levels. It has long been noted that food webs in coastal upwelling ecosystems tend to be structured around coastal pelagic species, such as krill, sardine, anchovy, and hake, that exhibit boom-bust cycles of abundance over decadal time scales {Bakun 1996, Schwartzlose et al. 1999}. Such dynamics have long been thought to be a consequence of the energetic and highly variable oceanographic processes that shape the physical environment and drive production throughout pelagic and benthic food webs in coastal upwelling ecosystems (such as the California Current system) over a range of time scales {Parrish et al. 1981, Mann and Lazier 1996}. The idea of wasp-waist control was first suggested by Rice {1995} and developed in greater detail in Cury et al. {2000}. The premise is that the low species diversity often observed in the middle of many upwelling ecosystems results in a vast majority of the energy in the food web flowing through coastal pelagic species such as sardine, anchovy, and mackerel. Many of these seem to feature "weak links" in their life cycles related to sensitivity to climate forcing, such that climate conditions determine the productivity of these stocks,

15 In this case, increased mortality of large sharks resulted from the use of shark nets to protect bathers, which subsequently caused an apparent increase in the abundance of smaller dusky and milk sharks on which they preferentially fed. This increase of smaller sharks resulted in a substantial decline in catch per unit effort of several populations of teleost fishes that were both commercially and recreationally important to coastal communities in the region.

and indirectly drive the dynamics of both higher and lower trophic levels.

Empirical evidence for any of these types of control is typically limited for large marine ecosystems {Hunt and McKinnell 2006}. However, where trophic interactions among exploited species are documented or suspected, ecosystem modeling can provide a template to evaluate both the magnitude and consequences of removals of either predators or prey in the system of interest {Hollowed et al. 2000, Christensen et al. 2004}. Although such models are unavoidably constrained by conceptual shortcomings and data limitations, most critical reviews of multispecies modeling approaches agree that ecosystem models can augment contemporary single species models by confronting an array of interactions and dynamics that are more difficult to address with single-species models, such as competition, predation and environmental variability {Hollowed et al. 2000, Fulton et al. 2003, Plagányi and Butterworth 2004}. For example, Walters, et al. {2005} used the results from a number of existing ecosystem models to demonstrate that widespread application of contemporary (MSY proxy) single-species management approaches could lead to dramatic impacts on ecosystem structure, particularly where such approaches are applied to forage species. Their results add considerable weight to the perceived need to consider forage species as resources whose value is derived from their role as prey to commercially and recreationally important stocks, a consideration consistent with recent the Council determination to place a precautionary ban on krill (euphausiid) harvests throughout the West Coast EEZ.

Dynamic simulations of an ecosystem model of the Northern California Current were developed by Field et al. {2006b}, who modeled the continental shelf and slope ecosystem between Cape Mendocino and Cape Flattery between 1960 and 2004. The model was based on, and tuned to, biomass estimates from stock assessments and surveys, consumption and production rates estimated from empirical studies or the literature, historical estimates of landings and discard rates, and the limited food habits data that were available in this region. The model was run forward first under the assumption of a constant environment, then forced dynamically with several climate indices. They found that most of the variability observed in single species models and dynamics can be replicated with a multi-species modeling approach, despite significant changes in food web structure and the abundance of both predators and prey in this ecosystem over time. In general, these results imply that over the macro-scale, there do not appear to be obvious changes in ecological structure that have resulted in strong interspecific interactions (predation, competition) between most of these species. One large exception to this generalization was Pacific hake, which by virtue of their large biomass and high consumption of forage species in the model were shown to have potential competitive interactions. Agostini {2005} found that most model components (particularly pandalid shrimp, rockfish, salmon, seabirds and marine mammals) benefited from a reduction in hake biomass, primarily as a result of increases in the availability of euphausiids, forage fish and other prey.

These results are consistent with what is known of the life histories for many of the rockfish, roundfish and longer-lived flatfish in the California Current, where low mortality rates are indicative of low predation rates and presumably weakly coupled trophic interactions. In other words, species with a low natural mortality rate are unlikely to be a “key prey species” for higher trophic level predators, and are consequently less likely to effect significant bottom-up control in the energy flow or structure of the ecosystem. Consequently, the effects of severe declines in the overfished species that were explicitly included in this model (canary rockfish, widow rockfish, and POP) to other elements of the ecosystem were minimal. The model found considerably stronger interspecific interactions in species such as shrimp, salmon, and small flatfish where there is high turnover and high predation coupled with substantial changes in many of their key predators (such as hake, sablefish, marine mammals) over the last forty years. There were, of course, other exceptions to this generalization; in fact one of the strongest interactions appeared to be among several of the slowest growing species; sablefish, shortspine thornyhead, and longspine thornyhead. Essentially, the model suggested that natural mortality rates for longspine thornyheads may have fallen by nearly fourfold over recent decades as a result of substantial declines in sablefish and shortspine thornyheads, their key predators. As a result, the expectation would be that longspine thornyhead abundance would increase over time, a prediction consistent with recent trawl survey results.

However, this work focused on integrating a broad array of species and habitats, and the piscivorous species of rockfish described in the previous section were not modeled as independent populations. For example, as the fauna and environmental conditions along the continental slope differ tremendously from those on the shelf and near the shelf break, evaluating these interactions more carefully is likely to require development of spatially explicit modeling efforts, coupled with more appropriate consideration of age and/or size based bioenergetic requirements and predation interactions. A comparable, but considerably more complex model, with greater population (demographic) structure, spatial complexity and explicit physical forcing {Fulton et al. 2004}, is currently under development by researchers at the NMFS Northwest Fisheries Science Center. As baseline knowledge and modeling abilities increase, such models will hold greater promise for successfully identifying the processes and mechanism of ecosystem change, and guiding decisions that might hasten the recovery of both individual species and sustain the community and ecosystem in which they reside.

Other theoretical considerations point to the potential for an important role for rebuilding species in the California Current over broad spatial and temporal scales, particularly the stocks that were historically more abundant. By virtue of their slow growth and low mortality rate, these stocks may fill a role in stabilizing highly dynamic ecosystems, by dampening what might otherwise be even greater ecological responses by high turnover species to rapid changes or short-term bursts in production {Apollonio 1994}. However, the same could be said of any ecosystem for which all stocks were at their "target" levels. The premise of nearly all contemporary fisheries management is that reducing stocks to target levels results is sustainable from a single species perspective, but there is little or no theoretical or empirical basis on which to conclude that this approach is optimal from the perspective of other, codependent elements of the ecosystem {Mangel et al. 2000, Goodman et al. 2002}. As Goodman et al. {2002} discuss, fishing to achieve any MSY-related objectives inevitably shifts the equilibrium biomass, age and size structure of a population from that which occurred in the unfished condition, and any such changes have the potential to propagate through the food web and effect consequent changes on other species.

The action considered in this EIS would authorize harvest of groundfish within EFH. The action is within the scope of fishery management actions analyzed in the EIS for groundfish EFH. Those analyses are incorporated by reference. A Record of Decision for Pacific Coast Groundfish EFH was issued on March 8, 2006 and concluded that partial approval of Amendment 19 to the FMP would minimize to the extent practicable adverse impacts to EFH from fishing. Amendment 19, approved on March 8, 2006, provides for a comprehensive strategy to conserve EFH, including its identification, designation of Habitat Areas of Particular Concern, and the implementation of measures to minimize to the extent practicable adverse impacts to EFH from fishing. The final rule implementing Amendment 19 will provide measures necessary to conserve EFH. Therefore, provided that the final alternative for this EIS is within the scope of Amendment 19, no additional EFH recommendations are necessary for this proposed action.

3.4 Discussion of Cumulative Impacts

"Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can

result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7).

While contemporary approaches to fisheries science focus on estimating surplus production, stock-recruit relationships and maximum sustainable yields, it is worth noting that from a purely "holistic" perspective, the fishing down of any species removes or alters energy pathways and ecological structure from either other species (such as seabirds and marine mammals) or other ecosystem processes {Aydin 2004}, although this observation does not invalidate the logic of surplus production from a single-species perspective. It has long been assumed that fish stocks and populations, and subsequently the ecosystems in which they exist, are healthy if they are maintained close to the levels that provide MSY. However, there is a growing body of ecological, genetic and theoretical evidence that suggests that this may not necessarily be a fair assumption, neither for the exploited species themselves nor the ecosystems in which they exist. A growing body of literature suggests that fisheries have the potential to effect substantial changes in both genetic and demographic characteristics of fish populations; as Stokes and Law {2000} suggest "to an evolutionary biologist, fishing is a massive uncontrolled experiment in evolutionary selection." Selection by fisheries has clearly been demonstrated to result in changes in size at age,[16] changes in size and age at maturity, changes in natural mortality and increased total fecundity {Mangel et al. 1993; Stokes and Law 2000; Mangel and Stamps 2001; Conover and Munch 2002; Stergieu 2002}; and some examples even suggest changes in body shape, alterations in heritable patterns of distribution and migration and even changes in avoidance behavior {Ricker 1981; Heino and Godø 2002}.

Their results speak not only to the necessity to consider evolutionary consequences, but also to the observation that the consequences could be detrimental to humans as well as fish. Quite simply, these evolutionary consequences can reduce the sustainable yield of a population by decreasing the age at maturity and consequently reducing the relative amount of somatic growth in a population relative to reproductive effort. As Conover {2000} suggests, "Yield… is not a currency that is crucial to fitness. From the fishes' point of view, the goal is maximizing the relative contribution of genes (not biomass) to succeeding generations." The current National Standard guidelines recognize the significance of such factors on both populations and ecosystems, as they state that the benefits of protecting marine ecosystems include "maintaining viable populations (including those of unexploited species), maintaining evolutionary and ecological processes (e.g., disturbance regimes, hydrological processes, nutrient cycles), maintaining the evolutionary potential of species and ecosystems, and accommodating human use" (50 C.F.R. 600.310). Such observations demonstrate that maintaining the role of species in an ecosystem, and minimizing the selective role of fishing on marine fish diversity on multiple levels, are both key challenges and crucial element to any future ecosystem-based approach to the management of marine resources.

From an idealistic perspective, an ecosystem-based approach to managing fisheries is clearly a common goal that would be in the interests of both the resources being managed and the resource users. A truly integrated ecosystem approach might make management decisions based on accurate indices of ecosystem productivity, the needs of other predators (such as seabirds and marine mammals), and the consequences of fishing on habitat and ecological structure. Unfortunately, the data necessary to develop and adequately parameterize multispecies models are lacking for most ecosystems, including

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16 As early as 1912 it was noticed that fish caught in the early or developing years of a fishery tended to be larger at age than those caught in more recent years, and it is now known that when mortality increases as a result of size-selected fishing; faster-growing individuals are removed at higher rates than slower-growing individuals. The result is that slower-growing animals make up a greater percentage of their age group; and the population in question is selected to be smaller at a given age over time. The same logic applies to the selection of earlier ages at maturity and to other selective factors.

the California Current. Even with adequate data, the ability of multispecies models to make meaningful predictions regarding the consequences of decisions is limited. Although multispecies models are capable of providing insight regarding potential or likely interspecific interactions, and can provide long term (strategic) guidance regarding likely ecosystem impacts of fishing, there are still far too many unanswered basic ecological questions to expect that the ecological consequences of fishing at alternative harvest rates can be described or quantified. For example, May {1999} reminds us that even basic mechanisms responsible for density-dependent or density independent regulatory mechanisms continue to be unresolved for many populations, an issue of particular importance for rockfish, for which stock assessment models estimate a wide spectrum between strong density dependence and strong density independence. It may be that the only certainty that managers can expect is that decisions will have to continue to be made with imperfect information.

3.5 Summary of Impacts

While considerable research has been undertaken to better understand trophic interactions and other ecosystem considerations throughout the U.S. and the world, and to consider the cumulative, large-scale effects of fishing on marine ecosystems from a more holistic perspective, there is no clear consensus on what would actually constitute precautionary harvest policies or rates from a multispecies or ecosystem perspective. As a result, there is no fundamental foundation upon which to consider the consequences of historical overfishing, or alternative strategies in rebuilding depleted species, with respect to the potential impacts or trade-offs to ecological integrity and future sustainability.

From a basic ecological perspective, all species have a role to fill in the system, and the loss or severe reduction of any stock or species could have reverberations throughout the food web. Even the reduction of fished populations to their target levels affects the flow of energy through the marine ecosystem, and has the potential to either modestly or massively alter the structure and integrity of the communities that either prey on, are preyed upon, or otherwise interact with those species. As discussed in section 3.1.6, some seabirds that depend on juvenile rockfish have undergone declines in breeding success, and declines in the availability of prey have been implicated as potential causes. However, ocean conditions and the effects of fishing are likely to be compounded, and the trends themselves are difficult to discern. Based on the observation that most resident or migratory marine mammal populations in the California Current have been increasing at modest to substantial rate over the past several decades (including California sea lions, harbor seals, elephant seals, gray whales, and humpback whales), it is similarly difficult to expect that the cumulative impacts of fishing have been detrimental for these guilds (independent of the incidental mortality resulting from fishing activity, described in section XXX).

Based on what is known or suspected about the large-scale nature of energy flow in upwelling environments, it is reasonable to expect that the cumulative impacts that have resulted from overfishing, and may continue to result from any delay in rebuilding, are modest to negligible when integrated across the entire California Current ecosystem. This is particularly true when considering the potential cumulative impact of depleting these populations below target levels (e.g., 10 percent to 25 percent of historical abundance) relative to depleting such populations to precisely their target levels (e.g., ~40 percent of historical abundance). However, for several rebuilding species, particularly those at higher trophic levels, these impacts may be more significant at smaller spatial scales for some habitat types and regions, since severe depletion may well have resulted in substantial shifts in the community composition of some benthic habitat. Furthermore, clearly identifying and evaluating the potential consequences to the ecosystem of modest changes in population trends and abundance that may result from deviations in rebuilding trajectories, above and beyond those that would have resulted from fishing stocks down precisely to target levels, is an analysis beyond the scope of existing data and capacity. The empirical data, either from visual or trawl surveys, are limited in their resolution, and although theoretical (simulated) studies suggest that thresholds between alternative stable states may exist, identifying such thresholds is beyond the realm of existing capacity.

What can be said is that the management measures that have been implemented over recent years by the Council do appear to have resulted in increasing abundance and productivity levels for rebuilding (and other) species, although such improvement may be a factor of climate and other unmanageable contributors as well. Moreover, the existing management approach is highly dependent on spatial closures, which effectively eliminate fishing mortality from broad areas of habitat that are optimal for both the rebuilding species and other, healthier groundfish stocks in the California Current. The protection of intact functional patches of habitat was identified by Baskett, et al. {2006} as one of the management measures that had the greatest potential to avoid or reverse changes in species composition on small rocky reef habitats. Moreover, recent action taken under the EFH amendments to the Groundfish FMP will not only protect additional habitat areas from trawl fishing impacts into the foreseeable future, but limit the ability to use large-footrope gear in nearshore habitat, further reducing the potential to impact high relief reef communities in those areas that remain shoreward of the 100 fm depth contour.

Consequently, the ability to say anything meaningful about the broad-scale ecosystem impacts associated with adopting one of the preferred alternatives above the other is by all measures an intractable question. Clearly the three OY options for rebuilding species differ in the trajectories they set for rebuilding populations, and clearly those options that rebuild stocks the most rapidly have the greatest potential to minimize the long-term ecological impacts to the ecosystem that may have resulted from their removal. However, there exists no meaningful way of quantitatively assessing the potential difference with respect to the risk of undesirable consequences of choosing one OY alternative over the other. To the extent that the two alternatives differ among each other (or from the status quo) with respect to area closures, there again might be some unquantifiable generalization that would suggest that the greater the protection of stocks from area closures, the lighter are the potential consequences of fishing to ecological structure and function.

3.5.1 No Action Alternative

In general, there is no empirical or theoretical evidence that declines in these stocks of West Coast rockfish have had impacts on predators or higher trophic level species, particularly impacts above and beyond those which might be expected by reduction of biomass to their target levels. However, there is potential evidence, largely theoretical, that among those rebuilding species that are higher trophic level predators there could be cascading ecological consequences to some benthic communities resulting from severe depletion and potential replacement by more opportunistic species. Again, the extent to which such impacts (if real) might be of a greater magnitude than those that would be expected under scenarios in which biomass declined to target levels is impossible to quantify.

The management measures currently in place for rebuilding groundfish rely primarily on the use of spatial management measures (area closures) in those depth zones and habitats in which these species are most frequently encountered. As such, these areas tend to represent the optimal habitat for these species, and are either known or suspected (from catch rate data, trawl surveys, ROV surveys, and other means) to sustain the highest densities of depleted species. Consequently, this approach would be expected to effectively maintain functioning habitat areas and/or metapopulations of rebuilding species with an extremely high degree of protection. The extent the no action alternative differs from the action alternatives is the extent to which the selected action alternative results in greater area closures and greater reductions in fishing mortality for rebuilding species.

3.5.2 The Action Alternatives

With respect to potential differences between the action alternative and the no action alternative (independent of the consequences of the different alternatives to the recovery trajectories of the stocks themselves), the broad scale, cumulative impacts to the ecosystem of different OY alternatives are for all intensive purposes beyond are ability to monitor and test. As discussed above, it is intuitive that the lower the fishing mortality rate, and the greater the extent of spatial closures, the greater the potential for rebuilding species to fill their niche or role in the ecosystem relative to the risk of changes or shifts in equilibrium or ecosystem states. The precision and abilities of multispecies or ecosystem models to accurately reflect the potential cumulative impacts to the ecosystem that result in slightly differing rebuilding trajectories is extremely low, particularly with respect to any ability to detect thresholds that may exist with respect to alternative stable states within either small or broad scale habitats and ecosystems.

This section will be summarized in greater detail following the June meeting...

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4.0 AFFECTED SPECIES

4.1 Species Description and Status

There are over 90 species of groundfish managed under the groundfish FMP. These species include over 60 species of rockfish in the family Scorpaenidae, 7 roundfish species, 12 flatfish species, assorted shark, skate, and a few miscellaneous bottom-dwelling marine fish species. Table 4-1 depicts the latitudinal and depth distributions of groundfish species managed under the groundfish FMP.

The following sections contain information on the life histories of a subset of the groundfish managed under the groundfish FMP. While reading these sections, it is important to keep in mind how certain life history traits of the species have important implications on how the stocks are sustainably managed.

In contrast to the highly variable, and often volatile, population cycles of many coastal pelagic and invertebrate populations in the California Current, many of the resident groundfish in the California Current have evolved entirely different life history approaches to coping with environmental variability. Sablefish, Dover sole, spiny dogfish and a large number of rockfish (*Sebastes* and *Sebastolobus*) species have lifespans that typically span decades, and in some extreme examples may reach ages of 100 or greater (Beamish, *et al.* 2006; Love, *et al.* 2002). Although large initial catches of many rockfish had given the impression that these stocks were also highly productive, a growing body of scientific evidence soon made it clear that many of these species were incapable of sustaining high intensity fishing pressure using modern fishing methods (Francis 1986; Gunderson 1977; Gunderson 1984; Leaman and Beamish 1984).

Among the concerns raised in some of the early research and analyses were that the large standing stocks of older individuals were simply maintaining themselves within the dynamic bounds of their ecosystem, and that the failure to consider the role of such longevity in Northeast Pacific groundfish could lead to management challenges. Factors such as extreme longevity, low natural mortality, increasing fecundity with age, and infrequent reproductive success (recruitment) were explicitly considered when initial harvest rate strategies were developed for the Council (e.g., (Clark 1991)). However, the paucity of data and magnitude of some of these factors as related to the low productivity of many species were not fully appreciated in many early studies, and are now known to be important considerations in developing harvest rate guidelines and management policies (Clark 2002; Dorn 2002). Consequently, harvest rates for many species have been reduced repeatedly in recent years to account for the improved knowledge regarding the overall productivity of these stocks. As new information continues to emerge regarding the significance of diverse age structures and other factors in sustaining groundfish resources (Berkeley 2004; Berkeley, *et al.* 2004; Bobko and Berkeley 2004), such information continues to be evaluated and incorporated into the stock assessment and assessment review processes that provide the scientific basis upon which management decisions are made.

Management of these groundfish species is based on principles outlined in the MSA, groundfish FMP, and national standard guidelines, which provide guidance on the 10 national standards in the MSA. Stock assessments are based on resource surveys, catch trends in West Coast fisheries, and other data sources. Section 6.1.4 describes, in general terms, how stock assessments are conducted and reviewed before they are applied in West Coast groundfish management.

Table 4-1. Latitudinal and depth distributions of groundfish species (adults) managed under the Pacific Coast Groundfish Fishery Management Plan. [a/]

Common name	Scientific name	Latitudinal Distribution		Depth Distribution (fm)	
		Overall	Highest Density	Overall	Highest Density
Flatfish Species					
Arrowtooth flounder	*Atheresthes stomias*	N. 34° N.lat.	N. 40° N.lat.	10-400	27-270
Butter sole	*Isopsetta isolepis*	N. 34° N.lat.	N. 34° N.lat.	0-200	0-100
Curlfin sole	*Pleuronichthys decurrens*	Coastwide	Coastwide	4-291	4-50
Dover sole	*Microstomus pacificus*	Coastwide	Coastwide	10-500	110-270
English sole	*Parophrys vetulus*	Coastwide	Coastwide	0-300	40-200
Flathead sole	*Hippoglossoides elassodon*	N. 38° N.lat.	N. 40° N.lat.	3-300	100-200
Pacific sanddab	*Citharichthys sordidus*	Coastwide	Coastwide	0-300	0-82
Petrale sole	*Eopsetta jordani*	Coastwide	Coastwide	10-250	160-250
Rex sole	*Glyptocephalus zachirus*	Coastwide	Coastwide	10-350	27-250
Rock sole	*Lepidopsetta bilineata*	Coastwide	N. 32°30' N.lat.	0-200	summer 10-44 winter 70-150
Sand sole	*Psettichthys melanostictus*	Coastwide	N. 33°50' N.lat.	0-100	0-44
Starry flounder	*Platichthys stellatus*	Coastwide	N. 34°20' N.lat.	0-150	0-82
Rockfish Species [b/]					
Aurora rockfish	*Sebastes aurora*	Coastwide	Coastwide	100-420	82-270
Bank rockfish	*Sebastes rufus*	S. 39°30' N.lat.	S. 39°30' N.lat.	17-135	115-140
Black rockfish	*Sebastes melanops*	N. 34° N.lat.	N. 34° N.lat.	0-200	0-30
Black-and-yellow rockfish	*Sebastes chrysomelas*	S. 40° N.lat.	S. 40° N.lat.	0-20	0-10
Blackgill rockfish	*Sebastes melanostomus*	Coastwide	S. 40° N.lat.	48-420	125-300
Blue rockfish	*Sebastes mystinus*	Coastwide	Coastwide	0-300	13-21
Bocaccio [c/]	*Sebastes paucispinis*	Coastwide	S. 40° N. lat., N. 48° N. lat.	15-180	54-82
Bronzespotted rockfish	*Sebastes gilli*	S. 37° N.lat.	S. 37° N.lat.	41-205	110-160
Brown rockfish	*Sebastes auriculatus*	Coastwide	S. 40° N.lat.	0-70	0-50
Calico rockfish	*Sebastes dallii*	S. 38° N.lat.	S. 33° N.lat.	10-140	33-50
California scorpionfish	*Scorpaena gutatta*	S. 37° N.lat.	S. 34°27' N.lat.	0-100	0-100
Canary rockfish	*Sebastes pinniger*	Coastwide	Coastwide	27-150	50-100
Chameleon rockfish	*Sebastes phillipsi*	37°-33° N.lat.	37°-33° N.lat.	95-150	95-150
Chilipepper rockfish	*Sebastes goodei*	Coastwide	34°-40° N.lat.	27-190	27-190
China rockfish	*Sebastes nebulosus*	N. 34° N.lat.	N. 35° N.lat.	0-70	2-50
Copper rockfish	*Sebastes caurinus*	Coastwide	S. 40° N.lat.	0-100	0-100
Cowcod	*Sebastes levis*	S. 40° N.lat.	S. 34°27' N.lat	22-270	100-130

Table 4-1. Latitudinal and depth distributions of groundfish species (adults) managed under the Pacific Coast Groundfish Fishery Management Plan (continued). [a]

Darkblotched rockfish	*Sebastes crameri*	N. 33° N.lat.	N. 38° N.lat.	16-300	96-220
Dusky rockfish [d]	*Sebastes ciliatus*	N. 55° N.lat.	N. 55° N.lat.	0-150	0-150
Dwarf-Red rockfish	*Sebastes rufinanus*	33° N.lat.	33° N.lat.	>100	>100
Flag rockfish	*Sebastes rubrivinctus*	S. 38° N.lat.	S. 37° N.lat.	17-100	shallow
Freckled rockfish	*Sebastes lentignosus*	S. 33° N.lat.	S. 33° N.lat.	22-92	22-92
Gopher rockfish	*Sebastes carnatus*	S. 40° N.lat.	S. 40° N.lat.	0-30	0-16
Grass rockfish	*Sebastes rastrelliger*	S. 44°40' N.lat.	S. 40° N.lat.	0-25	0-8
Greenblotched rockfish	*Sebastes rosenblatti*	S. 38° N.lat.	S. 38° N.lat.	33-217	115-130
Greenspotted rockfish	*Sebastes chlorostictus*	S. 47° N.lat.	S. 40° N.lat.	27-110	50-100
Greenstriped rockfish	*Sebastes elongatus*	Coastwide	Coastwide	33-220	27-136
Halfbanded rockfish	*Sebastes semicinctus*	S. 36°40' N.lat.	S. 36°40' N.lat.	32-220	32-220
Harlequin rockfish [e]	*Sebastes variegatus*	N. 40° N. lat.	N. 51° N. lat.	38-167	38-167
Honeycomb rockfish	*Sebastes umbrosus*	S. 36°40' N.lat.	S. 34°27' N.lat.	16-65	16-38
Kelp rockfish	*Sebastes atrovirens*	S. 39° N.lat.	S. 37° N.lat.	0-25	3-4
Longspine thornyhead	*Sebastolobus altivelis*	Coastwide	Coastwide	167->833	320-550
Mexican rockfish	*Sebastes macdonaldi*	S. 36°20' N.lat.	S. 36°20' N.lat.	50-140	50-140
Olive rockfish	*Sebastes serranoides*	S. 41°20' N.lat.	S. 40° N.lat.	0-80	0-16
Pacific ocean perch	*Sebastes alutus*	Coastwide	N. 42° N.lat.	30-350	110-220
Pink rockfish	*Sebastes eos*	S. 37° N.lat.	S. 35° N.lat.	40-200	40-200
Pinkrose rockfish	*Sebastes simulator*	S. 34° N.lat.	S. 34° N.lat.	54-160	108
Puget Sound rockfish	*Sebastes emphaeus*	N. 40° N.lat.	N. 40° N.lat.	6-200	6-200
Pygmy rockfish	*Sebastes wilsoni*	N. 32°30' N.lat.	N. 32°30' N.lat.	17-150	17-150
Quillback rockfish	*Sebastes maliger*	N. 36°20' N.lat.	N. 40° N.lat.	0-150	22-33
Redbanded rockfish	*Sebastes babcocki*	Coastwide	N. 37° N.lat.	50-260	82-245
Redstripe rockfish	*Sebastes proriger*	N. 37° N.lat.	N. 37° N.lat.	7-190	55-190
Rosethorn rockfish	*Sebastes helvomaculatus*	Coastwide	N. 38° N.lat.	65-300	55-190
Rosy rockfish	*Sebastes rosaceus*	S. 42° N.lat.	S. 40° N.lat.	8-70	30-58
Rougheye rockfish	*Sebastes aleutianus*	Coastwide	N. 40° N. lat.	27-400	27-250
Semaphore rockfish	*Sebastes melanosema*	S. 34°27' N.lat.	S. 34°27' N.lat.	75-100	75-100
Sharpchin rockfish	*Sebastes zacentrus*	Coastwide	Coastwide	50-175	50-175
Shortbelly rockfish	*Sebastes jordani*	Coastwide	S. 46° N.lat.	50-175	50-155
Shortraker rockfish	*Sebastes borealis*	N. 39°30' N.lat.	N. 44° N.lat.	110-220	110-220
Shortspine thornyhead	*Sebastolobus alascanus*	Coastwide	Coastwide	14->833	55-550
Silvergray rockfish	*Sebastes brevispinis*	Coastwide	N. 40° N.lat.	17-200	55-160

Table 4-1. Latitudinal and depth distributions of groundfish species (adults) managed under the Pacific Coast Groundfish Fishery Management Plan (continued). [a/]

Speckled rockfish	*Sebastes ovalis*	S. 38° N.lat.	S. 37° N.lat.	17-200	41-83
Splitnose rockfish	*Sebastes diploproa*	Coastwide	Coastwide	50-317	55-250
Squarespot rockfish	*Sebastes hopkinsi*	S. 38° N.lat.	S. 36° N.lat.	10-100	10-100
Starry rockfish	*Sebastes constellatus*	S. 38° N.lat.	S. 37° N.lat.	13-150	13-150
Stripetail rockfish	*Sebastes saxicola*	Coastwide	Coastwide	5-230	5-190
Swordspine rockfish	*Sebastes ensifer*	S. 38° N.lat.	S. 38° N.lat.	38-237	38-237
Tiger rockfish	*Sebastes nigrocinctus*	N. 35° N.lat.	N. 35° N.lat.	30-170	35-170
Treefish	*Sebastes serriceps*	S. 38° N.lat.	S. 34°27' N.lat.	0-25	3-16
Vermillion rockfish	*Sebastes miniatus*	Coastwide	Coastwide	0-150	4-130
Widow rockfish	*Sebastes entomelas*	Coastwide	N. 37° N.lat.	13-200	55-160
Yelloweye rockfish	*Sebastes ruberrimus*	Coastwide	N. 36° N.lat.	25-300	27-220
Yellowmouth rockfish	*Sebastes reedi*	N. 40° N.lat.	N. 40° N.lat.	77-200	150-200
Yellowtail rockfish	*Sebastes flavidus*	Coastwide	N. 37° N.lat.	27-300	27-160
Roundfish Species					
Cabezon	*Scorpaenichthys marmoratus*	Coastwide	Coastwide	0-42	0-27
Kelp greenling	*Hexagrammos decagrammus*	Coastwide	N. 40° N.lat.	0-25	0-10
Lingcod	*Ophiodon elongatus*	Coastwide	Coastwide	0-233	0-40
Pacific cod	*Gadus macrocephalus*	N. 34° N.lat.	N. 40° N.lat.	7-300	27-160
Pacific whiting	*Merluccius productus*	Coastwide	Coastwide	20-500	27-270
Sablefish	*Anoplopoma fimbria*	Coastwide	Coastwide	27->1,000	110-550
Shark and Skate Species					
Big skate	*Raja binoculata*	Coastwide	S. 46° N.lat.	2-110	27-110
California skate	*Raja inornata*	Coastwide	S. 39° N.lat.	0-367	0-10
Leopard shark	*Triakis semifasciata*	S. 46° N.lat.	S. 46° N.lat.	0-50	0-2
Longnose skate	*Raja rhina*	Coastwide	N. 46° N.lat.	30-410	30-340
Soupfin shark	*Galeorhinus zyopterus*	Coastwide	Coastwide	0-225	0-225
Spiny dogfish	*Squalus acanthias*	Coastwide	Coastwide	0->640	0-190
Other Species					
Finescale codling	*Antimora microlepis*	Coastwide	N. 38° N.lat.	190-1,588	190-470
Pacific rattail	*Coryphaenoides acrolepis*	Coastwide	N. 38° N.lat. Coastwide	85-1,350	500-1,350
Ratfish	Hydrolagus colliei	Coastwide	Coastwide	0-499	55-82

Table 4-1. Latitudinal and depth distributions of groundfish species (adults) managed under the Pacific Coast Groundfish Fishery Management Plan (continued). [a/]

a/ Data from Casillas et al. 1998, Eschmeyer et al. 1983, Hart 1973, Miller and Lea 1972, Love et al. 2002, and NMFS survey.
data. Depth distributions refer to offshore distributions, not vertical distributions in the water column.
b/ The category "rockfish" includes all genera and species of the family Scorpaenidae, even if not listed, that occur in the Washington, Oregon, and California area.
c/ Only the southern stock of bocaccio south of 40°10' N. lat. is listed as overfished.
d/ Dusky rockfish do not occur on the U.S. West Coast south of 49° N. lat. The species needs to be removed from the FMP.
e/ Only two occurrences of harlequin rockfish south of 51° N. lat. (off Newport, OR and La Push, WA; Casillas et al. 1998).

The passage of the Sustainable Fisheries Act in 1996 incorporated the current conservation and rebuilding mandates into the MSA. These mandates—including abundance-based standard reference points for declaring the status of a stock (overfished; in a "precautionary" status; or at levels that can support MSY (healthy or "rebuilt"))—were subsequently incorporated in the groundfish FMP with adoption of Amendments 11 and 12. These reference points are determined relative to an estimate of "virgin" or unexploited spawning biomass of the stock, denoted as $SB_{0,}$ which is defined as the average equilibrium abundance of a stock's spawning biomass before it is affected by fishing-related mortality.[17] SB_0 is then used to estimate MSY, as identified in the Magnuson-Stevens Act and national standard guidelines. MSY represents a theoretical maximum surplus production from a population of constant size; national standard guidelines define it as "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions." For a given population and set of ecological conditions, there is a biomass that produces MSY (denoted as B_{MSY}), which is less than the equilibrium size in the absence of fishing (B_0). (Generally, population sizes above B_{MSY} are assumed to be less productive, because of competition for resources or other density dependent factors.) The harvest rate used to achieve or sustain B_{MSY} is referred to as the Maximum Fishing Mortality Threshold (MFMT, denoted as F_{MSY}). Two harvest specification reference points, defined in the groundfish FMP, provide guidance in setting the harvest rate: a total catch OY and an ABC. The Council identifies the OY as the management target for each species or species complex. When the stock biomass is determined to be lower than $B_{MSY,}$ the OY is set to less than the ABC in order to rebuild the stock to a healthy level (see the following discussion). The ABC, which is the maximum allowable harvest, is calculated by applying an estimated or proxy F_{MSY} harvest rate to the estimated abundance of the exploitable stock.

The biomass level that produces MSY (i.e. B_{MSY}) is generally unknown and assumed to be variable over time due to long-term fluctuations in ocean conditions, so that no single value is appropriate. Furthermore, F_{MSY} is tightly linked to an assumed level of density dependence in recruitment, and there is insufficient information to determine that level for many West Coast groundfish stocks. Therefore, the use of approximations or proxies is necessary; absent of a more accurate determination of $F_{MSY,}$ the Council applies default MSY proxies. The Council-specified proxy MSY abundance for most West Coast groundfish species is 40% of B_0 (denoted as $B_{40\%}$), meaning that the Council adopts management actions aimed to maintain abundance of each stock at or above approximately 40% of its virgin biomass.

[17] The current abundance of a stock relative to its unfished level is commonly written as a percentage or a proportion; this value represents the stock's depletion level. In addition to using a comparison between current spawning biomass and unfished spawning biomass to determine this reference point, some stock assessment authors compare current and unfished levels of spawning output or of total stock biomass (B), depending on the information that is available.

The Council-specified threshold for declaring a stock overfished or depleted is when the stock's spawning biomass declines to less than 25% of B_0 (denoted as $B_{25\%}$). The MSA and national standard guidelines refer to this threshold as the Minimum Stock Size Threshold or MSST. A rebuilding plan that specifies how total fishing-related mortality is constrained to achieve an MSY abundance level within the legally allowed time is required by the MSA and groundfish FMP when a stock is declared depleted.

Stocks estimated to be above the depletion threshold, yet below an abundance level that supports MSY, are considered to be in the "precautionary zone." The Council has specified precautionary reductions in harvest rate for such stocks in order to increase abundance to $B_{40\%}$. The methodology for determining this precautionary reduction is described in the groundfish FMP and is referred to as the 40-10 adjustment. As the stock declines below $B_{40\%}$, the total catch OY is reduced from the ABC until, at 10% of B_0, the OY is set to zero. However, in practice the 40-10 adjustment only applies to stocks above $B_{25\%}$ (the MSST) because once a stock falls below this level, an adopted rebuilding plan supplants it. Most stocks with an estimated abundance greater than $B_{40\%}$ are managed by setting harvest to the ABC. Figure 4-1 presents this framework graphically.

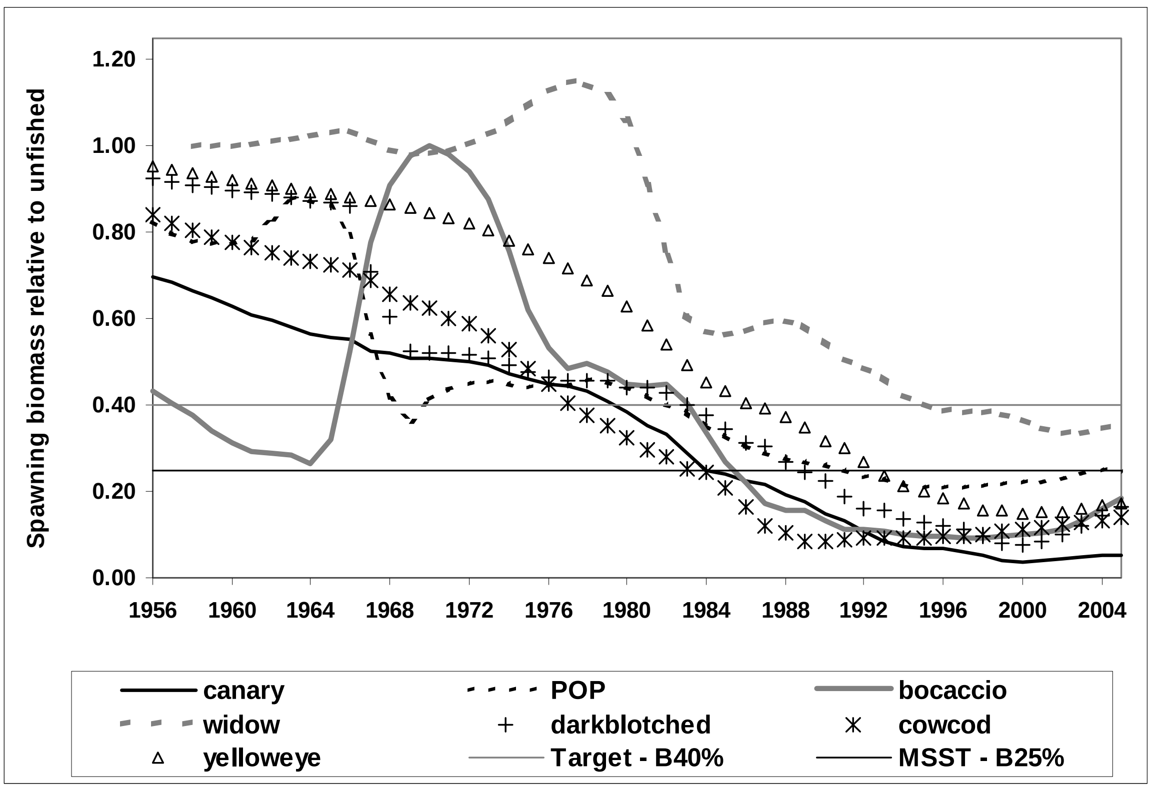


Figure 4-1. Relative depletion trends for rebuilding rockfish species

Sections 4.1.1, 4.1.2 and 4.1.3 describe groundfish stocks according to the categories just described: overfished, precautionary zone, and healthy. However, it is important to realize that of the more than 90 species in the management unit, only a portion is individually managed. Thus, the remaining species are managed and accounted for in groupings or stock complexes (discussed in section 4.1.4) because individually they comprise a small part of the landed catch and insufficient information exists to develop the stock assessments necessary to set an OY based on yield estimates. (The groundfish FMP identifies the OY for these species as an average of historical catch, based on the assumption that this is below MSY.)

Twenty-three stock assessments were performed in the 2005 stock assessment cycle, and two of these assessments (Pacific whiting, *Merluccius productus* and yelloweye rockfish, *Sebastes ruberrimus*) were redone in early 2006. One assessment, that for vermillion rockfish (*Sebastes miniatus*), was not accepted by the Scientific and Statistical Committee (SSC) as being suitable for the provision of quantitative management advice. Table 4-2 presents a summary of the results of the twenty-two assessments that were accepted as being suitable bases for management, including depletion (the estimated spawning biomass or output relative to the unfished condition), and the associated current and unfished spawning biomass, recent trends in abundance, and the estimated catch level at MSY. Table 4-3 lists life history parameters from the twenty-two stock assessments; steepness of the spawner-recruitment curve (h), the von Bertalanffy Equation growth constant (k), and natural mortality (M) are each important contributors to the understanding of the productivity and resiliency of a species.

Complimentary to this overview, Table 4-4 provides a general overview of the data that were available for each of these assessments, including a qualitative description of the extent to which assessments might be considered data-rich or data-poor, and the estimated or assumed value used in the stock assessment for the steepness of the spawner/recruit curve (generally an indicator of the productivity of the stock). Of these full assessments, only 14 of the 23 conducted in 2005 and 2006 had what might be considered moderate to good information (although these are generally the species that account for the vast majority of groundfish catches in the California Current). In general, stock assessments for nearshore species tend to lack fishery-independent trend information, and rely primarily on catch-per-unit-effort (CPUE) data and demographic data from recreational fisheries. By contrast, assessments for most shelf and slope species are informed by fisheries independent surveys and demographic information from commercial fisheries, and as such tend to be more data rich than those for nearshore species. Although fishery-dependent CPUE data exist for many commercial groundfish species, for most species such series have been truncated to the period prior to 2000, as a result of the difficulties interpreting catch rates given marked changes in management measures for West Coast fisheries in recent years.

Table 4-2. Summary results from twenty-two stock assessments adopted by the Council in 2005 and 2006

Species (base models)	Depletion	Average annual % change in SSB 2000-2005	Average annual % change in SSB 1995-2000	2005 Spawning biomass	2005 Total Biomass	Unfished Spawning Biomass	Unfished Total Biomass	Spawning Biomass at MSY	Harvest Rate at MSY	MSY	MSY basis
Blackgill rockfish	0.52	0.1	0.2	4977	13051	9503	21558	3799	0.029	223	F50%
Bocaccio rockfish	0.11	12.7	1.2	1430	8561	13402	69924	5361	0.0632	1768	F50%
Cabezon (N+S)	0.38	3.7	2.2	516	922	1361	2291	522	0.13	145	F45%
California scorpionfish	0.80	5.3	3.9	816	1866	1024	2007	259	0.161	127	Estimated
Canary rockfish (blended)	0.09	7.2	-11.2	3211	*7438*	34155	*90941*	N/A	N/A	N/A	Estimated
Cowcod	0.17	4.3	4.0	542	593	3191	3045	N/A	0.033	N/A	N/A
Darkblotched rockfish	0.17	16.2	-9.4	4447	10717	26650	28286	10660	0.038	650	F50%
Dover sole	0.63	5.3	3.7	188987	423049	299054	614545	117281	0.0672	16505	F40%
English sole	0.91	12.4	14.4	31379	56134	34312	63642	5696	0.231	4080	Estimated
Gopher rockfish	0.97	-3.3	11.6	1931	2385	1995	2440	798	0.103	101	F50%
Lingcod (N+S)	0.64	24.8	13.1	N/A	34017	N/A	52850	N/A	N/A	N/A	N/A
Longspine thornyhead	0.71	-0.6	-2.3	75049	162642	105157	228275	28305	0.055	3687	F50%
Kelp greenling (OR)	0.49	-8.9	-4.0	157	597	321	1295	123	0.125	82	F45%
Pacific whiting**	0.31	11.2	-9.8	1178000	2500000	3810000	7832000	1060000	N/A	574000	F40%
Pacific Ocean perch	0.23	2.4	0.9	8846	22440	37838	83218	15135	0.0324	1181	F50%
Petrale sole (N+S)	0.31	23.1	8.1	9628	23056	31367	54085	6779	0.13	3164	Estimated
Sablefish	0.34	0.3	-3.0	75070	23255	218860	723474	87544	0.05	2784	F50%
Shortspine thornyhead	0.63	0.0	-0.6	82151	144513	130646	230500	52258	0.0184	1720	F50%
Starry flounder (N+S)	0.50	-8.9	0.7	3566	8901	7158	17956	2864	0.169	1214	F40%
Widow rockfish	0.31	-1.1	-1.8	15444	93685	49678	230505	19871	N/A	N/A	F50%
Yelloweye rockfish	0.17	3.2	-6.6	573	1579	3322	7616	1329	0.024	N/A	F50%
Yellowtail rockfish (3 area)	0.55	-1.0	2.3	16915	74217	31016	120024	15508	0.0863	4680	F50%

* Or spawning output, in eggs or other means, as reported for darkblotched and widow rockfish.

** Pacific whiting values refer to those from the base (q=1) model in the 2006 assessment, based on carrying forward the life history parameters estimated at the end of the modeling period. An equally plausible model in which q was estimated had results that would generally be scaled upwards.

Table 4-3. Summary of life history parameters identified in the twenty-two stock assessments adopted by the Council in 2005 and 2006.

Species	Steepness of spawner recruit curve (h)		von Bertalanffy Equation growth constant (k)		Natural Mortality (M)	
			Females	**Males**	**Females**	**Males**
Blackgill rockfish	0.65	Fixed	0.068	0.04	0.4	0.4
Bocaccio rockfish	0.21	Estimated	0.19	0.21	0.15	0.15
Cabezon	0.70	Fixed	0.20	0.20	0.25	0.3
California scorpionfish	0.70	Fixed	0.13	0.120	0.25	0.25
Canary rockfish	0.40	Estimated	0.14	0.175	0.06 (young) 0.09 (old)	0.06
Cowcod	0.50	Fixed	0.06	0.06	0.055	0.055
Darkblotched rockfish	0.95	Fixed	0.2	0.25	0.07	0.07
Dover sole	0.80	Fixed	0.1189	0.0732	0.09	0.09
English sole	0.83	Estimated	0.23-0.40 a/	0.28-0.48 a/	0.26	0.26
Gopher rockfish	0.65	Fixed	0.186	0.186	0.2	0.2
Lingcod	0.90	Fixed	LCN: 0.104 LCS: 0.145	LCN: 0.149 LCS: 0.223	0.18	0.32
Longspine thornyhead	0.75	Fixed	0.064	0.064	0.06	0.06
Kelp greenling	0.70	Fixed	0.30 c/	.40 c/	0.26	0.26
Pacific whiting	0.75	Fixed	0.33	0.33	0.23	0.23
Pacific Ocean perch	0.55	Estimated	N/A b/	N/A b/	0.051	0.051
Petrale sole	0.72 - 0.88		0.08	0.08	0.2	0.2
Sablefish	0.34	Prior	0.246	0.298	0.07	0.07
Shortspine thornyhead	0.60	Fixed	0.018	0.018	0.05	0.05
Starry flounder	0.80	Fixed	0.251	0.426	0.3	0.45
Widow rockfish	0.28	Estimated	North: 0.14 South: 0.2	North: 0.18 South: 0.25	0.125	0.125
Yelloweye rockfish	0.44	Fixed	0.0664	0.0664	0.036	0.036
Yellowtail rockfish	N/A		F: 0.07-0.23	0.08-0.25 (est.)	0.11 - 0.28	0.11

a/ The base case model allowed growth for each sex to differ between blocks of time, based on freely estimating the K parameter.

b/ Size at age was determined using an empirical matrix rather than a von Bertalanffy curve, so no value of k was set.

c/ Values are for the Oregon substock analysis of the kelp greenling assessment, as the CA substock analysis was not adopted for management by the Council.

d/ 0.11 for ages 4-6; increases linearly to estimated max M (0.16-0.28) at age 25

Table 4-4. Overview of the primary data sources available for each of the 22 stock assessments adopted by the PFMC in 2005-2006.

Species	General data quality and consistency	Commercial fishery data: cpue index	Commercial fishery data: latest year	Commercial fishery data: age comps	Commercial fishery data: length comps	Recreational fishery data: index used	Recreational fishery data: last year	Recreational fishery data: age comps	Recreational fishery data: length comps	Fishery independent surveys: trawl survey	Fishery independent surveys: age comps**	Fishery independent surveys: length comps	Fishery independent surveys: other surveys***
Blackgill rockfish	poor	no		no	yes	no		no	no	shelf/slope	no	yes	
Bocaccio rockfish	good	no		no	yes	yes	2003	no	yes	shelf	no	yes	larval
Cabezon	moderate	no		no	yes	yes	2003	no	yes	no	n/a	n/a	larval
California scorpionfish	moderate	no		no	yes	yes	2003	no	yes	LA san.	n/a	n/a	pre-rec
Canary rockfish	good	yes	1996	yes	yes	yes	1998	yes	yes	shelf	yes	yes	
Cowcod	poor	no		no	no	yes	2000	no	no	no	n/a	n/a	submersible
Darkblotched rockfish	moderate	no		yes	yes	no		no	no	shelf/slope	yes	yes	
Dover sole	good	yes	1995	yes	yes	no		no	no	shelf/slope	yes	yes	
English sole	good	no		yes	yes	no		no	no	shelf	yes	yes	
Gopher rockfish	poor	no		no	yes	yes	2004	no	yes	no	n/a	n/a	
Lingcod	good	yes	1997	yes	yes	no		yes	yes	shelf	yes	yes	
Longspine thornyhead	moderate-poor	no		no	yes	no		no	no	slope	no	yes	
Kelp greenling	poor	no		no	yes	yes	2002	no	yes	no	n/a	n/a	
Pacific whiting	good	no		yes	yes	no		no	no	shelf	yes	yes	acoustic, rec
Pacific Ocean perch	good	yes	1974	yes	yes	no		no	no	shelf/slope	yes	yes	
Petrale sole	moderate	yes	1999	yes	yes	no		no	no	shelf	no	yes	
Sablefish	good	yes	1988	yes	yes	no		no	no	shelf/slope	yes	yes	pot
Shortspine thornyhead	moderate-poor	no		no	yes	no		no	no	shelf/slope	no	yes	
Starry flounder	poor	yes	2004	no		no		no	yes	no	n/a	n/a	pre-rec
Widow rockfish	moderate	yes	1999	yes	yes	no		no	no	shelf	no	no	pre-rec
Yelloweye rockfish	poor	no		yes	yes	yes	2000	yes	yes	no	no	no	
Yellowtail rockfish	good	yes	1999	yes	yes	no		no	no	shelf	yes	yes	

* This refers solely to the richness of data and the internal consistency of the data within the assessment, as interpreted subjectively from the assessments, STAR Panel reports, SSC reports, and GMT discussions; in no way is this intended to be a reflection of the abilities of assessment authors or teams

** The use of age composition data infers that sufficient age data were available to be used to tune the age composition of the modeled population, this does not include age data used to fit growth curves or estimate natural mortality rates

*** Larval surveys refer to indices of larval abundance from California Cooperative Oceanic Fisheries Investigations (CalCOFI) plankton surveys, generally used as a relative index of spawning biomass, pre recruit surveys are from the Southwest Fisheries Science Center's juvenile rockfish survey or other sources, and submersible surveys refer to biomass estimates derived from visual observations.

4.1.1 Depleted Groundfish Species

4.1.1.1 Bocaccio

Distribution and Life History

Bocaccio (*Sebastes paucispinis*) is a rockfish species that ranges from Krozoff and Kodiak Islands in the Gulf of Alaska to central Baja California, Mexico (Hart 1988; Miller and Lea 1972). Love, et al. (Love, *et al.* 2002) and Thomas and MacCall (Thomas and MacCall. 2001) describe bocaccio distribution and life history. Bocaccio are historically most abundant in waters off central and southern California. The southern bocaccio stock is most prevalent at the 54-82 fm depth zone (Casillas, *et al.* 1998).

Bocaccio are found in a wide variety of habitats, often on or near bottom features, but sometimes over muddy bottoms. They are found both nearshore and offshore (Sakuma and Ralston 1995). Larvae and small juveniles are pelagic (Garrison and Miller 1982) and are commonly found in the upper 100 m of the water column, often far from shore (MBC 1987). Large juveniles and adults are semi-demersal and are most often found in shallow coastal waters over rocky bottoms associated with algae (Sakuma and Ralston 1995). Adults are commonly found in eelgrass beds, or congregated around floating kelp beds (Love, *et al.* 1990; Sakuma and Ralston 1995). Young and adult bocaccio also occur around artificial structures, such as piers and oil platforms (MBC 1987). Although juveniles and adults are usually found around vertical relief, adult aggregations also occur over firm sand-mud bottoms (MBC 1987). Bocaccio move into shallow waters during their first year of life (Hart 1988), then move into deeper water with increased size and age (Garrison and Miller 1982).

Bocaccio are ovoviviparous (live young are produced from eggs that hatch within the female's body) (Garrison and Miller 1982; Hart 1988). Love et al. (Love, *et al.* 1990) reported the spawning season to last nearly an entire year (>10 months). Parturition occurs during January to April off Washington, November to March off Northern and Central California, and October to March off Southern California (MBC 1987). Fecundity ranges from 20,000 to 2,300,000 eggs. In California, two or more broods may be born per year (Love, *et al.* 1990). The spawning season is not well known in northern waters. Males mature at three to seven years, with about half maturing in four to five years. Females mature at three to eight years, with about half maturing in four to six years (MBC 1987).

Maximum age of bocaccio was radiometrically determined to be at least 40 years, and perhaps more than 50 years. Bocaccio are difficult to age, and stock assessments used length measurement data and growth curves to estimate the age composition of the stock. Although recent assessments have described the true natural mortality rate as a key unknown for estimating stock status, recent assessments have used a value of 0.15 (which is associated with an 86% adult annual survival rate in the absence of fishing mortality).

Larval bocaccio eat diatoms, dinoflagellates, tintinnids, and cladocerans (Sumida and Moser 1984). Copepods and euphausiids of all life stages (adults, nauplii and egg masses) are common prey for juveniles (Sumida and Moser 1984). Both Phillips (1964) and Love et al. (2002) described bocaccio rockfish as almost exclusively piscivorous, and include other rockfish, Pacific whiting, sablefish, anchovy, mesopelagic fishes and squid as the key prey for large juvenile and adult bocaccio. Bocaccio are eaten by sharks, salmon, other rockfishes, lingcod, albacore, sea lions, porpoises, and whales (MBC 1987). Adult bocaccio are often caught with chilipepper rockfish and have been observed schooling with speckled, vermilion, widow, and yellowtail rockfish (Love, *et al.* 2002). As pelagic juveniles, they may compete with chilipepper, widow, yellowtail, shortbelly and other pelagic juvenile rockfishes for both food and habitat (Reilly, *et al.* 1992).

Stock Status and Management History

There are two separate West Coast bocaccio populations. The southern stock exists south of Cape Mendocino and the northern stock north of 48° N latitude in northern Washington (off Cape Flattery). It is unclear whether this stock separation implies stock structure. The distribution of the two populations and evidence of lack of genetic intermixing suggests stock structure, although MacCall (MacCall 2002) sees some recent evidence for limited genetic mixing of the two populations. Nonetheless, assessment scientists and managers have treated the two populations as independent stocks north and south of Cape Mendocino. The northern stock of bocaccio has not been assessed.

Bocaccio have long been an important component of California rockfish fisheries. Catches increased to high levels in the 1970s and early 1980s as relatively strong year-classes recruited to the stock. The Council began to recommend increasingly restrictive regulations after an assessment of the southern stock in 1990 (Bence and Hightower 1990) indicated that fishing rates were too high. The southern stock suffered poor recruitment during the warm water conditions that prevailed off Southern California beginning in the late 1980s. The 1996 assessment (Ralston, *et al.* 1996) indicated the stock was in severe decline. NMFS formally declared the stock overfished in March 1999 after the groundfish FMP was amended to incorporate the tenets of the Sustainable Fisheries Act. MacCall et al. (MacCall, *et al.* 1999) confirmed the overfished status of bocaccio and estimated spawning output of the southern stock to be 2.1% of its unfished biomass.

While previous assessments only used data from central and northern California, the assessment in 2002 (MacCall and He 2002) also included data for southern California. Although relative abundance increased slightly from the previous assessment (4.8% of unfished biomass), potential productivity (as evidenced from the steepness of the spawner/recruit relationship, which reflects the level of compensatory production at low stock sizes) appeared lower than previously thought, making for a more pessimistic outlook. Furthermore, the 2002 assessment revealed that although the 1999 year class was the strongest in several years, it was weak relative to the range of possibilities considered in the 1999 assessment.

The 2003 bocaccio assessment differed greatly from the 2002 assessment. It was affected by additional CalCOFI data that suggested an increasing abundance trend, more complete understanding of the 1999 year class and by a revised (lower) estimate of the natural mortality rate (MacCall 2003b). The results of these calculations suggested that recreational CPUE had increased dramatically in recent years and was at a record high level in central California north of Pt. Conception. The STAR Panel recommended the use of two assessment models as a means of bracketing uncertainty from the very different signals between the Triennial Survey and the recreational CPUE data. Following the STAR Panel meeting, MacCall presented a third "hybrid" model (STATc) that incorporated the data from all of the indices. The SSC recommended and the Council approved the use of this third modeling approach. This resulted in modest improvement in estimated stock size, but significantly affected the estimated productivity of the stock. These results had substantial effects on the rebuilding outlook for bocaccio, which, under the 2002 assessment, was not expected to rebuild within T_{MAX} even with no fishing related mortality. Total mortality in 2003 fisheries was restricted to less than 20 mt as a means of conserving the stock while minimizing adverse socioeconomic impacts to communities. The 2003 rebuilding analysis (MacCall 2003a), using the "hybrid" model, suggested the stock could rebuild to B_{MSY} within 25 years while sustaining an OY of approximately 300 mt in 2004.

The 2003 assessment was updated in 2005 (MacCall 2006b). The assessment used the original Stock Synthesis model (SS1), and did not develop an equivalent new Stock Synthesis 2 (SS2) version of the assessment. In addition to new length frequency data, new data points were included from both the triennial survey and the CALCOFI larval abundance index, both of which suggested an increasing upwards trajectory for the stock. The updated base-case (STATc) model forecasts a slow increase in biomass (spawning output), with depletion (current spawning output divided by unfished spawning output) increasing from a current value of 10.7% to approximately 20% over the coming decade. The estimated 2005 total biomass (age1+) was 8,561 mt. The 2004 exploitation rate of 0.0103 was well below the maximum fishing mortality threshold (F_{MSY}). The 2003 OY was set at 20 mt and the retained catch was about 12 mt. Including mortality of estimated discards, estimated total catch was 22 mt. The 2004 OY was set at 199 mt, but due to constraints of co-occurring depleted stocks, realized catch was 78 mt. Thus, recent management has shown substantial improvement in performance.

A bocaccio rebuilding plan was adopted by the Council at its April 2004 and submitted for incorporation in the groundfish FMP under Amendment 16-3. The rebuilding plan established a target rebuilding year of 2023 and the harvest control rule of F = 0.0498 (with a P_{MAX} of 70%). (It was later clarified in the 2005 Rebuilding Analysis (MacCall 2006a) that the target rebuilding year had been incorrectly stated in the rebuilding plan to be 2023; since the 2003 rebuilding analysis indicated that a 50% probability rebuilding would require 23 years, and that this assumed a beginning date of 2004 (the first simulated year), the correct value of T_{targ} is 2027.) Revision to the bocaccio rebuilding plan is under consideration by the Council and such changes to the groundfish FMP would be enacted through Amendment 16-4; the analysis of the action is a purpose of this EIS.

4.1.1.2 Canary Rockfish

Distribution and Life History

Canary rockfish (*Sebastes pinniger*) range from northern Baja California, Mexico, to southeastern Alaska (Boehlert and Kappenman 1980; Hart 1988; Love 1991; Miller and Lea 1972; Richardson and Laroche 1979). There is a major population concentration of canary rockfish off Oregon (Richardson and Laroche 1979). Canary rockfish primarily inhabit waters 91 m to 183 m (50 fm to 100 fm) deep (Boehlert and Kappenman 1980). In general, they inhabit shallow water when they are young, and deep water as adults (Mason 1995). Adult canary rockfish are associated with pinnacles and sharp drop-offs (Love, *et al.* 1991) and are most abundant above hard bottoms (Boehlert and Kappenman 1980). In the southern part of their range, canary rockfish appear to be associated with reefs (Boehlert 1980). In Central California, newly settled canary rockfish are first observed at the seaward sand-rock interface and farther seaward in deeper water (18 m to 24 m).

Canary rockfish off the West Coast exhibit a protracted spawning period from September through March, probably peaking in December and January off Washington and Oregon (Hart 1988; Johnson, *et al.* 1982). Female canary rockfish reach sexual maturity at roughly eight years of age. Like many members of Sebastes, canary rockfish are ovoviviparous, whereby eggs are internally fertilized within females, and hatched eggs are released as live young (Bond 1979; Golden and Demory 1984; Kendall, Jr. and Lenarz 1986). Canary rockfish are a relatively fecund species, with egg production being correlated with size (e.g., a 49-cm female can produce roughly 0.8 million eggs, and a female that has realized maximum length (approximately 60 cm) produces approximately 1.5 million eggs (Gunderson 1971)).

Very little is known about the early life history strategies of canary rockfish. The limited research that has been conducted indicates that larvae are strictly pelagic (near the ocean surface) for a short period of time and begin to migrate to demersal waters during the summer of their first year of life. Larvae develop into juveniles around nearshore rocky reefs, where they may congregate for up to three years (Boehlert 1980; Sampson 1996). Evaluations of length distributions by depth demonstrate an increasing trend in mean size of fish with depth (Methot and Stewart 2006). Since 1990, stock assessments have assumed a base natural mortality rate of 0.06 (94% adult annual survival when there is no fishing mortality). Due to the rarity of old females in both survey and catch data, female canary rockfish have long been assumed to have increasing natural mortality rates with age (Golden and Wood 1990).

Little is known about ecological relationships between canary rockfish and other organisms. Adult canary rockfish are often caught with bocaccio, sharpchin, yelloweye, and yellowtail rockfishes, and lingcod. Researchers have also observed canary rockfish associated with silvergray and widow rockfish. Young-of-the-year feed on copepods, amphipods, and young stages of euphausiids. Adult canary rockfish feed primarily on euphausiids, as well as pelagic shrimp, cephalopods, mesopelagic fishes and other prey {Phillips 1964; Brodeur and Pearcy 1984; Lee 2002}. Small canary rockfish are consumed by seabirds, Chinook salmon, lingcod, and marine mammals.

Stock Status and Management History

Canary rockfish have long been an important component of rockfish fisheries. The Council began to recommend increasingly restrictive regulations after an assessment in 1994 (Sampson and Stewart 1994) indicated that fishing rates were too high. In hindsight, work has estimated that the abundance of the canary rockfish stock dropped below $B_{40\%}$ (an abundance level used as a proxy for MSY) in about 1980, at which time the annual catch was more than double the current estimate of the MSY level. Harvest rates in excess of the current fishing mortality target for rockfish ($SPR_{50\%}$) is estimated to have begun in the late 1970s and persisted through 1999. Recent management actions appear to have curtailed the rate of removal such that overfishing has not occurred since 1999, and recent SPR values are in excess of 90%.

A 1999 stock assessment showed the stock had declined below the overfished level ($B_{25\%}$) in the northern area (Columbia and U.S. Vancouver management areas), (Crone, *et al.* 1999) and in the southern area (Conception, Monterey, and Eureka areas, (Williams, *et al.* 1999). The stock was declared overfished in January 2000. The first rebuilding analysis (Methot 2000) used results from the northern area assessment to project rates of potential stock recovery. The stock was found to have extremely low productivity, defined as production of recruits in excess of the level necessary to maintain the stock at its current, low level. Rates of recovery were highly dependent upon the level of recent recruitment, which could not be estimated with high certainty. The initial rebuilding OY for 2001 and 2002 was set at 93 mt based upon a 50% probability of rebuilding by the year 2057, a medium level for these recent recruitments, and maintaining a constant annual catch of 93 mt through 2002.

In 2002, a coastwide assessment of canary rockfish was conducted (Methot and Piner 2002), treating the stock as a single unit from the Monterey management area north through the U.S. Vancouver area. This was a departure from the methodologies of past assessments. Although there is some evidence of genetic separation of the northern and southern stocks (Boehlert and Kappenman 1980; Wishard, *et al.* 1980), the observed variability in growth rate by sex and area was not significantly different at small versus large spatial scales.

A critical uncertainty in past and current canary rockfish assessments is the lack of older, mature females in surveys and other assessment indices. There are two competing explanations for this observation. Older females could have a higher natural mortality rate, resulting in their disproportionate disappearance from the population. Alternatively, survey and fishing gears may be less effective at catching them, perhaps because older females are associated with habitat inaccessible to most trawl gear. If this is the case, then these fish (which, because of their higher spawning output, may make an important contribution to future recruitment) are part of the population, but remain poorly sampled. The most recent assessment assumed a linear increase in female natural mortality from 0.06 at age 6 to approximately 0.09 at age 14 (Methot and Stewart 2006). . The 2005 assessment was based on two equally plausible assessment models (as recommended by the SSC); one with differential male and female gear selectivities and one without gender-specific selectivities. The approved canary rockfish rebuilding analysis blended the two models by alternately re-sampling between the two input parameter sets. Both laboratory-based physiological studies and habitat-specific studies of the distribution of older male and female canary rockfish could better inform managers of the significance of these patterns and assumptions.

A full canary rockfish assessment was done in 2005 (Methot and Stewart 2006). As explained above, the assessment was based on two equally plausible models. In the base model (differential male-female selectivity) SB_0 is estimated to be 34,798 mt, resulting in a depletion level of 5.7%. In the alternate model (no difference in selectivity) SB_0 is estimated to be 33,872 mt, with a depletion level of 11.3%. The steepness of the spawner-recruitment relationship, which largely determines the rate of increase in recruitment as the stock rebuilds, was estimated to be 0.33 in the base model, and 0.45 in the alternate model,

A new rebuilding analysis was also completed in 2005 (Methot 2006). Using the integrated ("blended") model explained above, the analysis estimated SB_0 to be 34,155 mt of female spawning biomass at the beginning of 2005 (corresponding to a depletion level of 9.4%). In this analysis, it was noted that following the constant harvest rate established under the canary rockfish rebuilding plan would produce an OY of 43 mt in 2007 and has a 57.4% probability of rebuilding by the current Ttarget (2074) and a 58.5% probability of rebuilding by the current Tmax (2076). The new structure of the analysis allowed for the incorporation of three sources of uncertainty, rather than one; the result of this is that it would take a large change in the constant harvest rate harvest rate (and short-term OY) to make a large change in the probability of rebuilding. For example, the harvest rate that would produce a 50% probability of rebuilding by the target rebuilding year (2074) is twice the level that would produce a 60% probability of rebuilding by T_{max} (2076).

A canary rockfish rebuilding plan was adopted by the Council in June 2003 and submitted for incorporation in the groundfish FMP under Amendment 16-2. The rebuilding plan established a target rebuilding year of 2074 and the harvest control rule of F = 0.022 (with a P_{MAX} of 60%). Revision to the canary rockfish rebuilding plan is under consideration by the Council and such changes to the groundfish FMP would be enacted through Amendment 16-4; the analysis of the action is a purpose of this EIS.

4.1.1.3 Cowcod

Distribution and Life History

Relatively little is known about cowcod (*Sebastes levis*), a species of large rockfish that ranges from Ranger Bank and Guadalupe Island in central Baja California to Usal, Mendocino County, California (Miller and Lea 1972), and may infrequently occur as far north as Newport, Oregon.

Love et al. (Love, *et al.* 2002) and Barnes (Barnes 2001) described cowcod distribution and life history. Cowcod are most abundant in waters off central and southern California. They range from 22-491 m in depth and are considered to be parademersal (transitional between a midwater pelagic and benthic species). Adults are commonly found at depths of 180 m to 235 m and juveniles are most often found in 30 m to 149 m of water (Love, *et al.* 1990).

MacGregor (MacGregor 1986) found that larval cowcod are almost exclusively found in Southern

California and may occur many miles offshore. Cowcod have always been among the rarest of *Sebastes* species larvae identifiable to species in the southern California Bight (the core CalCOFI survey area), with estimates of abundance as much as two orders of magnitude less than more abundant species (Moser, *et al.* 2000). Juveniles occur over sandy bottom areas, and solitary ones have been observed resting within a few centimeters of soft-bottom areas where gravel or other low relief was found (Allen 1982). Young-of-the-year have been observed on fine sand and clay sediment as well as oil platform shell mounds and other complex bottom features at depths ranging from 22-122 fm (40-224 m). Adult cowcod are primarily found over high relief rocky areas (Allen 1982). They are generally solitary, but occasionally aggregate (Love, *et al.* 1990). Although cowcod are generally not migratory, they may move, to some extent, to follow food (Love 1991).

Cowcod can live to be at least 55 years old. Maximum size is 94 cm (37 in) and 13 kg (28.5 lb). The instantaneous rate of natural mortality is believed to be 0.08 (92% adult annual survival when there is no fishing mortality) (Butler, *et al.* 1999). Average size at age of mature females is similar to males. Females reach 90% of their maximum expected size by 40 years (Butler, *et al.* 1999).

Cowcod are ovoviviparous, and large females may produce up to three broods per season (Love, *et al.* 1990). Spawning peaks in January in the Southern California Bight (MacGregor 1986). Fecundity is dependent on size and ranges from 181,000 to 1,925,000 eggs. Larvae emerge at about 5.0 mm (MacGregor 1986).

Little is known about ecological relationships between cowcod and other organisms. Small cowcod feed on planktonic organisms such as copepods. Juveniles eat shrimp and crabs, and adults eat fish, octopus, and squid (Allen 1982). Adults consume a wide range of prey items, but are primarily piscivorous (Love, *et al.* 2002).

<u>Stock Status and Management History</u>

While cowcod are not a major component of the groundfish fishery, they are highly desired by both recreational and commercial fishers because of their bright color and large size. The cowcod stock in the Conception area was first assessed in 1998 (Butler, *et al.* 1999). Abundance indices decreased approximately tenfold between the 1960s and the 1990s, based on commercial passenger fishing vessel (CPFV) logs (Butler, *et al.* 1999). Recreational and commercial catch also declined substantially from peaks in the 1970s and 1980s, respectively.

NMFS declared cowcod in the Conception and Monterey management areas overfished in January 2000, after Butler et al. (Butler, *et al.* 1999) estimated the 1998 spawning biomass to be at 7% of B_0, well below the 25% overfishing threshold. Because cowcod is a fairly sedentary species, closed areas were established in 2002 to reduce cowcod mortality. These Cowcod Conservation Areas, located in the Southern California Bight, were selected due to their high density of cowcod; while fishing for nearshore rockfish and pelagic species is allowed within the CCAs, fishing with most gear types that could catch cowcod is prohibited.

A cowcod rebuilding analysis was completed in 2003 which validated the assumption that non-retention regulations and area closures had been effective in constraining cowcod fishing mortality (Butler, *et al.* 2003). These encouraging results were based on cowcod fishery-related landings in recreational and commercial fisheries, although the assessment included discard information only with respect to CPFV observations (which indicated negligible discards in that sector). This rebuilding review pointed out a common problem among the analyses of depleted species: reliance on landings (fishery-dependent) data for providing relative abundance values becomes increasingly difficult as the allowable catch is decreased and fishery observer data remains low. Monitoring stock status and recovery thus becomes increasingly difficult in the absence of fishery-independent surveys.

As in the 1999 assessment, the 2005 cowcod assessment (Piner, *et al.* 2006) considered only the cowcod population in Southern California Bight (from the US-Mexico border north to Point Conception) population, as this is the area in which cowcod are most abundant, adult habitat is most common, and catches are highest.. The 2005 assessment used only two data sources, the CPFV time series and the visual survey estimate data. The model was developed in Stock Synthesis 2, and although the base model estimated only three parameters (two of which were "nuisance parameters," the other was equilibrium recruitment), the STAR Panel determined that this simplicity was appropriate given the paucity of data. The assessment provides a set of results corresponding to three different values for assumed steepness (h), the key parameter in the S-R relationship (h=0.4, 0.5, and 0.6). Although the model with assumed h=0.5 was deemed the most likely by the STAR panel, there is still considerable uncertainty around both this value and the overall results of the assessment itself. The assessment estimated that the 2005 spawning biomass was 18% of unfished levels, within a range of 14 to 21% depending on the value assumed for steepness, a considerably more optimistic result than the 1999 assessment.

The rebuilding analysis (Piner 2006) estimated a new T_{max} of 2074, 25 years earlier than the 2099 date estimated previously (Butler and Barnes 2000). It is noted in the rebuilding analysis, however, that rebuilding scenarios are extremely uncertain for this data-poor species, particularly with respect to steepness. Moreover, there is widespread concern about the ability to monitor the stock, and consequently to evaluate progress towards rebuilding in the future.

A cowcod rebuilding plan was adopted by the Council in April 2004 and submitted for incorporation in the groundfish FMP under Amendment 16-3. The rebuilding plan established a target rebuilding year of 2090 and the harvest control rule of F = 0.009 (with a P_{MAX} of 60%). Revision to the cowcod rebuilding plan is under consideration by the Council and such changes to the groundfish FMP would be enacted through Amendment 16-4; the analysis of the action is a purpose of this EIS.

4.1.1.4 Darkblotched Rockfish

<u>Distribution and Life History</u>

Darkblotched rockfish (*Sebastes crameri*) are found from Santa Catalina Island off Southern California to the Bering Sea (Miller and Lea 1972; Richardson and Laroche 1979). They are most abundant from Oregon to British Columbia. Off Oregon, Washington, and British Columbia, darkblotched rockfish occur primarily on the outer shelf and upper slope (Richardson and Laroche 1979). Distinct population groups have been found off the Oregon coast between 44°30' N latitude and 45°20' N latitude (Richardson and Laroche 1979).

Young-of-the-year recruit to bottom at depths ranging from 55-200 m after spending up to five months as pelagic larvae and juveniles in offshore waters (Love, *et al.* 2002). Off central California, young darkblotched rockfish recruit to soft substrate and low (<1 m) relief reefs (Love 1991). Darkblotched rockfish make limited migrations after they become adults (Gunderson 1977). Adults occur in depths of 25 m to 600 m, and 95% are found between 50 m and 400 m (Allen and Smith 1988). Adults are often found on mud near cobble or boulders. Fish tend to move to deeper waters as they age.

Maximum age of darkblotched rockfish is 64 years, and maximum size is 58 cm (23 in) and 2.3 kg (5.1 lb). Rogers, et al. (Rogers, *et al.* 2000) estimated that the instantaneous rate of natural mortality was about 0.05 (95% adult annual survival when there is no fishing mortality). Females tend to be larger than males of the same age, and reach 90% of their maximum expected size by 13 years (Rogers, *et al.* 2000).

Darkblotched rockfish are ovoviviparous (Nichol and Pikitch 1994). Insemination of female darkblotched rockfish occurs from August to December, and fertilization and parturition occur from December to March off Oregon and California, and primarily in February off Oregon and Washington (Hart 1988; Nichol and Pikitch 1994; Richardson and Laroche 1979). Fecundity is dependent on size and ranges from 20,000 to 610,000 eggs.

Little is known about ecological relationships between darkblotched rockfish and other organisms. Pelagic juveniles feed on planktonic organisms such as copepods. Adults are often caught with other fish such as Pacific ocean perch and splitnose rockfish. Midwater animals such as euphausiids and amphipods dominate the diet of adult fish. Albacore and Chinook salmon consume pelagic juveniles (Hart 1988). Little is known about predation of adults.

Stock Status and Management History

Darkblotched rockfish has always been caught primarily with commercial trawl gear, as part of a complex of slope rockfish. Catch of darkblotched rockfish very likely first became significant in the mid-to-late 1940's, during which time it accelerated dramatically due to increases in gear efficiency and demand (Harry and Morgan 1963; Scofield 1948). During the mid 1960's to mid 1970's darkblotched rockfish were caught by both domestic and foreign fleets (Rogers 2003b). Domestic landings rose from late 1970's until the late 1980's, although limits on rockfish catch were first instituted in 1983, when darkblotched was rockfish managed as part of a group of around 50 species (designated as the Sebastes complex) (Rogers, *et al.* 2000). During the 2000's, progressive steps have been taken to reduce the catch of darkblotched rockfish, following the declaration of its overfished status in 2001. However, management goals (ABC or OY) for darkblotched rockfish were exceeded from 1997 through 2002. Although the 1996 assessment produced an ABC calculation for darkblotched, from 1997 through 2000 that amount was combined with yields for other species for purposes of managing a complex of species to combined ABC and OY amounts. Separate ABCs and OYs for darkblotched have been specified since 2001; however the species continues to be managed as part of a slope rockfish trip limit. Based on discard estimates now available from observer and logbook data for 2000-2003, the species-specific ABC was exceeded during 1997-2000 and the OY was exceeded in 2001 and 2002. However in 2004, the OY was not exceeded (based on the final estimate of total mortality, including discards).

Rogers et al. (Rogers, *et al.* 2000) completed an assessment in 2000 that employed a more extensive length-based stock synthesis modeling than had been used in the previous (1996) assessment (which had followed a simple F=M methodology verified by limited modeling using length based stock synthesis). This assessment determined the stock was at 14-31% of its unfished level, depending on assumptions regarding the historic catch of darkblotched rockfish in the foreign fishery from 1965-1978. More than any other issue of uncertainty, the uncertainty of historical foreign catch compositions had the greatest influence on the assessment model's calculation of stock status; as the proportion of the overall catch assumed to be composed of darkblotched was increased in the model, the estimates of B_0 also increased, bringing the current stock size estimate closer to a overfished level. Four accepted model runs varied the assumed foreign catch proportion from 0%-20%, which resulted in significant differences in B_0 and the spawning index. Only one of those model runs (assuming 0% foreign catch of darkblotched) estimated the stock was not overfished. The STAR Panel (PFMC 2000) and the GMT were unable to resolve the uncertainty in foreign catch composition. Therefore, the Stock Assessment Team's (STAT) assumption that 10% of foreign catch was comprised of darkblotched (Rogers, *et al.* 2000) was accepted, leading to the conclusion that the spawning stock biomass was 22% of its unfished level.

Given that the stock was estimated to be below the overfished threshold ($B_{25\%}$), NMFS declared darkblotched rockfish to be overfished in 2001; the same year, the Council adopted a rebuilding analysis for the stock (Methot and Rogers 2001). On the earlier recommendation of the SSC (June 2001 Council meeting), the authors incorporated results of the 2000 triennial slope trawl survey conducted by the Alaska Fishery Science Center and modeled a more recent time series of recruitments. Incorporating these data resulted in a downward revision of the estimated recruitment and abundance, throughout the time series, compared to what had been used in the Rogers et al. (Rogers, *et al.* 2000) assessment. For example, the mean recruitment in the 1983-1996 period was estimated to be about 67% of earlier estimates. Overall, this led to a revised estimate of spawning stock biomass at the beginning of 2002 of 14% of its unfished level. The minimum time to rebuild (T_{MIN}) in the absence of fishing was estimated to be 14 years with a median rebuilding year of 2014. The maximum time to rebuild (T_{MAX}) in accordance with the National Standard 1 Guidelines was 47 years (2047).

An assessment update for darkblotched rockfish, completed in 2003, suggested that the stock had not changed significantly from the previous assessment, but there was evidence of strong recent recruitment (Rogers 2003a). However these high numbers of fish added to the exploitable stock had not been validated by indices used in the assessment, so the spawning stock biomass was determined to be at 11% of it unfished level ($B_{11\%}$). New information in this update included revised estimates of the darkblotched rockfish catch in historical foreign fisheries, new fishery length and age composition information, a new Triennial Survey data point, and new slope survey data. Unresolved data discrepancies between these data sources, related to length and age composition, limited the amount of new data used in this assessment update. The SSC STAR Lite Panel requested progressive inclusion of 1997-1999, 2000, and 2001 recruitment estimates (Ralston, *et al.* 2003). Risk of error progressively increased from including those recruitment estimates because they were based on increasingly limited data. Rebuilding results were sensitive to the high 2000 and 2001 recruitment estimates and including them allowed much greater 2004 OYs because those recruits enter the fishery and help rebuild the stock before the maximum allowable year; based on the recommendations of the SSC STAR Lite Panel, the assessment was amended to include the recruitment estimate for 2000.

The 2005 assessment (Rogers 2006) was a full assessment. It incorporated data from a large number of sources, allowing for the estimation of landings back to 1928. The major sources of uncertainty in this stock assessment include: 1) the assumed natural mortality rate (M), 2) the age-length relationship, 3) noisy survey indices and length compositions due to a few large survey catches which tend to have larger than average fish, 4) steepness (h) parameter for the spawner-recruit curve, and 5) the amount of historical landings prior to 1978. Uncertainty in the model results were explored primarily through examination of alternative natural mortality values. Estimates for M varied depending on the calculation method chosen, ranging from 0.025-0.5 (based on Hoenig's method (Hoenig 1983)) to 0.107 (from a linear relationship with reproductive effort). Investigating the range from 0.05 to 0.10, Rogers found that the best fitting M value conflicted among the different data sources; the primary source of this conflict was the AFSC slope survey. The STAR panel determined that the confidence intervals produced within the models underestimated uncertainty (Ralston, *et al.* 2006). The Panel concluded that uncertainty could be bracketed by assuming that an M value of 0.07 is likely (base model), while 0.05 and 0.09 are the unlikely extremes.

Higher natural mortality values bring about calculations of smaller historical declines in stock abundance and larger current biomass levels. Applying the STAR Panel selected value of M=0.07, the assessment determined the biomass of age 1+ darkblotched rockfish to have declined by 84% from 1928 to 1999; since 1999, the age 1+ biomass has more than doubled. There were several strong recruitments in recent years, even though spawning stock has been at a low level. The 1999 year class is the strongest since the 1980 year class. The estimated spawning stock biomass depletion at the beginning of 2005 was 16% of unfished biomass ($B_{16\%}$).

A darkblotched rockfish rebuilding plan was first adopted by the Council in June 2003 and submitted for incorporation in the groundfish FMP under Amendment 16-2. The rebuilding plan established a target rebuilding year of 2030 and the harvest control rule (constant fishing rate) of F = 0.027 (with a probability of rebuilding by T_{MAX} of 80%). Applying the results from the 2003 rebuilding analysis {(Rogers 2003a)}, the harvest control rule was changed beginning in 2004 via a regulatory amendment. The new harvest control rule of F = 0.032 was used to set annual darkblotched OYs in 2004-2006 and resulted in an updated P_{MAX} of >90%. Revision to the darkblotched rockfish rebuilding plan is under consideration by the Council and such changes to the groundfish FMP would be enacted through Amendment 16-4; the analysis of the action is a purpose of this EIS.

4.1.1.5 Pacific Ocean Perch

Distribution and Life History

Pacific ocean perch (POP, *Sebastes alutus*) are found from La Jolla, California to the western boundary of the Aleutian Archipelago (Eschmeyer, *et al.* 1983; Gunderson 1971; Ito, *et al.* 1986; Miller and Lea 1972), but are common from Oregon northward (Eschmeyer, *et al.* 1983). They primarily inhabit waters of the upper continental slope (Dark and Wilkins 1994) and are found along the edge of the continental shelf (Archibald, *et al.* 1983). Pacific ocean perch occur as deep as 825 m, but usually are at 100 m to 450 m and along submarine canyons and depressions (NOAA 1990). Throughout their range, POP are generally associated with gravel, rocky, or boulder type substrate (Ito 1986). Larvae and juveniles are pelagic; subadults and adults are benthopelagic (living and feeding on the bottom and in the water column). Adults form large schools 30 m wide, to 80 m deep, and as much as 1,300 m long (NOAA 1990). They also form spawning schools (Gunderson 1971). Juvenile POP form ball-shaped schools near the surface or hide in rocks (NOAA 1990).

Pacific ocean perch winter and spawn in deeper water (>275 m). In the summer (June through August) they move to feeding grounds in shallower water (180 m to 220 m) to allow gonads to ripen (Archibald, *et al.* 1983; Gunderson 1971; NOAA 1990). They are slow-growing and long-lived; the maximum age has been estimated at about 98 years (Heifetz, *et al.* 2000). The can grow up to about 54 cm and 2 kg (Archibald, *et al.* 1983; Beamish 1979; Eschmeyer, *et al.* 1983; Ito, *et al.* 1986; Mulligan and Leaman 1992; NOAA 1990). POP are carnivorous. Larvae eat small zooplankton. Small juveniles eat copepods, and larger juveniles feed on euphausiids (krill). Adults eat euphausiids, shrimps, squids, and small fishes. Immature fish feed throughout the year, but adults feed only seasonally, mostly April through August (NOAA 1990). POP predators include sablefish and Pacific halibut.

Stock Status and Management History

POP were harvested exclusively by U.S. and Canadian vessels in the Columbia and Vancouver INPFC areas prior to 1965. Large Soviet and Japanese factory trawlers began fishing for POP in 1965 in the Vancouver area and in the Columbia area a year later. Intense fishing pressure by these foreign fleets occurred from 1966 to 1975. The MSA, passed by Congress in 1976, ended foreign fishing within 200 miles of the United States coast.

The POP resource off the West Coast was overfished before implementation of the groundfish FMP in 1982, and Council actions to conserve the resource likewise predate the FMP. Large removals of POP in the foreign trawl fishery, followed by significant declines in catch and abundance, led the Council to limit harvest beginning in 1979. A 20-year rebuilding plan for POP was adopted in 1981. Rebuilding under this original plan was largely influenced by a cohort analysis of 1966-1976 catch and age composition data (Gunderson 1979), updated with 1977-1980 data (Gunderson 1981), and an evaluation of trip limits as a management tool (Tagart, *et al.* 1980). This was the first time trip limits were used by the Council to discourage targeting and overharvest of an overfished stock, and it remains a management strategy in use today in the West Coast groundfish fishery. In addition to trip limits, the Council significantly lowered the OY for POP. After twenty years of rebuilding under the original plan, the stock stabilized at a lower equilibrium than estimated in the pre-fishing condition. While continuing stock decline was abated, rebuilding was not achieved as the stock failed to increase in abundance to B_{MSY}.

Ianelli (Ianelli and Zimmerman 1998) estimated POP female spawning biomass in 1997 to be at 13% of its unfished level, thereby confirming that the stock was overfished. NMFS formally declared POP overfished in March 1999 after the groundfish FMP was amended to incorporate the tenets of the Sustainable Fisheries Act. The Council adopted and NMFS enacted more conservative management measures in 1999 as part of a redoubled rebuilding effort.

A 2000 POP assessment suggested the stock was more productive than originally thought (Ianelli, *et al.* 2000). A revised POP rebuilding analysis was completed and adopted by the Council in 2001 (Punt and Ianelli 2001). This analysis estimated a T_{MIN} of 12 years and a T_{MAX} of 42 years. It was noted in the rebuilding analysis that the ongoing retrospective analysis of historic foreign fleet catches was likely to change projections of POP rebuilding.

The 2003 POP assessment (Hamel, *et al.* 2003) incorporating updated survey and fishery data including the retrospective of foreign fleet catches (Rogers 2003b). The assessment covered areas from southern Oregon to the U.S. border with Canada, the southern extent of POP distribution. The overall conclusion was that the stock was relatively stable at approximately 28% of its unfished biomass ($B_{28\%}$). Of all the changes and additions to the data, the historical catch estimates had the greatest effect, resulting in lower estimates of both equilibrium unfished biomass (B_0) and maximum sustainable yield.

Many cases were presented in the 2003 rebuilding analysis and, based on SSC advice, the Council chose the one based on the full Bayesian posterior distribution, in which recruits were re-sampled to project future recruitment. Re-sampling recruits rather than recruits per spawner was recommended because only the southern fringe of the stock occurs in waters off the U.S. West Coast. One would want to resample recruits per spawner if measured recruitment is a function of measured stock size. However, it is unlikely that the recruitment measured off the U.S. West Coast is wholly from the portion of the parental stock occurring in these same waters.

The 2005 assessment (Hamel 2006) is an update and uses the same model as in the 2003 assessment, a forward projection age-structured model (Hamel, *et al.* 2003). The assessment incorporates new data and changes to the data used in the previous assessment. As was the case in the previous assessment, a number of sources of uncertainty are explicitly accounted for, such as that associated with natural mortality, the parameters of the stock-recruitment relationship, and catchability coefficients for the different surveys. However, sensitivity analyses based upon alternative model structures/data set choices suggested that the overall uncertainty may be greater than that predicted by a single model specification, as was also the case in the 2003 assessment. There are also other sources of uncertainty that are not included in the current model. These include the degree of connection between the stocks of Pacific ocean perch off British Columbia and those in PFMC waters; the effect of the PDO, ENSO and other climatic variables on recruitment, growth and survival of Pacific ocean perch; gender differences in growth and survival; a possible non-linear relationship between individual spawner biomass and effective spawning output and more complicated relationship between age and maturity. In order to provide the Council with a means to incorporate this uncertainty into its decision making, Hamel undertook the following analysis: he estimated, based on a reference case, the Bayesian posterior distributions for key management and rebuilding variables. These distributions best reflect the uncertainty of the assessment's analysis, and are suitable for probabilistic decision making. The assessment estimated the following values based on the maximum of the posterior density function (MPD) point estimate: spawning biomass depletion at the start of 2005 equal to 23.4% and a 2007 ABC equal to 746 mt. Overfishing for POP is considered to be occurring when F is above F_{MSY} = 0.0310 according to the current assessment base model. The 2005 rebuilding analysis (Hamel and Hame 2006) re-estimated T_{MIN} to be 2015.

A Pacific ocean perch rebuilding plan was adopted by the Council in June 2003 and submitted for incorporation in the groundfish FMP under Amendment 16-2 (approved by NMFS in January 2004). The rebuilding plan established a target rebuilding year of 2027 and a harvest control rule of F = 0.0082 (with a P_{MAX} of 70%). The 2003 assessment (Hamel, *et al.* 2003) and rebuilding analysis (Punt, *et al.* 2003) was used to amend the harvest control rule and set annual POP OYs for the 2004-2006 period. The amended harvest control rule was F = 0.0257, which increased the estimated P_{MAX} to slightly greater than 70%. Revision to the Pacific ocean perch rebuilding plan is under consideration by the Council and such changes to the groundfish FMP would be enacted through Amendment 16-4; the analysis of the action is a purpose of this EIS.

4.1.1.6 Widow Rockfish

Distribution and Life History

Widow rockfish (*Sebastes entomelas*) range from Albatross Bank off Kodiak Island to Todos Santos Bay, Baja California, Mexico (Eschmeyer, *et al.* 1983; Miller and Lea 1972; NOAA 1990). They occur over hard bottoms along the continental shelf (NOAA 1990) and prefer rocky banks, seamounts, ridges near canyons, headlands, and muddy bottoms near rocks. Large widow rockfish concentrations occur off headlands such as Cape Blanco, Cape Mendocino, Point Reyes, and Point Sur. Adults form dense, irregular, midwater and semi-demersal schools deeper than 100 m at night and disperse during the day (Eschmeyer, *et al.* 1983; NOAA 1990; Wilkins 1986). All life stages are pelagic, but older juveniles and adults are often associated with the bottom (NOAA 1990). All life stages are fairly common from Washington to California (NOAA 1990). Pelagic larvae and juveniles co-occur with yellowtail rockfish, chilipepper, shortbelly rockfish, and bocaccio larvae and juveniles off Central California (Reilly, *et al.* 1992).

Widow rockfish are ovoviviparous, have internal fertilization, and brood their eggs until released as larvae {NOAA 1990; Ralston et al. 1996a; Reilly et al. 1992}. Mating occurs from late fall-early winter. Larval release occurs from December through February off California, and from February through March off Oregon. Juveniles are 21 mm to 31 mm at metamorphosis, and they grow to 25 cm to 26 cm over three years. Age and size at sexual maturity varies by region and sex, generally increasing northward and at older ages and larger sizes for females. Some mature in three years (25 cm to 26 cm), 50% are mature by four years to five years (25 cm to 35 cm), and most are mature in eight years (39 cm to 40 cm) (NOAA 1990). The maximum age of widow rockfish is 28 years, but rarely over 20 years for females and 15 years for males (NOAA 1990). The largest size is 53 cm and about 2.1 kg (Eschmeyer, *et al.* 1983; NOAA 1990).

Widow rockfish are carnivorous. Adults feed on small pelagic crustaceans, midwater fishes (such as age-one or younger Pacific whiting), salps, caridean shrimp, and small squids (Adams 1987; NOAA 1990). During spring, the most important prey item is salps, during the fall fish are more important, and during the winter widow rockfish primarily eat sergestid shrimp (Adams 1987). Feeding is most intense in the spring after spawning (NOAA 1990). Pelagic juveniles are opportunistic feeders, and their prey consists of various life stages of calanoid copepods, and euphausiids (Reilly, *et al.* 1992).

Stock Status and Management History

Widow rockfish are an important commercial species from British Columbia to central California, particularly since 1979, when Oregon trawl fisherman demonstrated the ability to make large catches at night using midwater trawl gear. Many more participants have entered the fishery since that time, and landings of widow rockfish have increased rapidly (Love, *et al.* 2002). Widow rockfish are a minor component of the recreational groundfish fisheries.

Williams (Williams, *et al.* 2000) assessed the coastwide stock of widow rockfish in 2000. The spawning output level (8,223 mt eggs), based on that assessment and a revised rebuilding analysis (Punt and MacCall 2002) adopted by the Council in June 2001, was at 23.6% of the unfished level (33,490 mt eggs) in 1999.

The 2003 assessment (He, *et al.* 2003b) concluded that the widow rockfish stock size was at 24.65% of the unfished biomass, but indicated that stock productivity was considerably lower than previously thought. Data sparseness was a significant problem in this widow rockfish assessment (Conser, *et al.* 2003; He, *et al.* 2003b).

A full assessment was completed in 2005 for widow rockfish (He, *et al.* 2006). In addition to including the new data from 2003 to 2004, this assessment added an index of relative abundance based on the triennial survey data and estimated the power coefficient of the midwater juvenile survey index instead of using a fixed value. The base model estimated that spawning biomass declined steadily since the early 1980s and that spawning output in 2004 was 31% of the unexploited level, above the Council's overfished threshold. Further, spawning output in the base model was estimated to have never dropped below the 25% overfished threshold. Alternative model runs, which were considered to be only slightly less plausible than the base model, however, indicated that the stock had been below $B_{25\%}$. The 2005 rebuilding analysis indicated that the stock was much closer to reaching a rebuilt biomass than previously estimated: under the current rebuilding analysis T_{MIN} is estimated to be 2013, compared to a T_{MIN} of 2026 in the 2003 analysis (He, *et al.* 2003a).

Using estimates from the 2003 widow rockfish rebuilding analysis (He, *et al.* 2003a), the Council adopted a rebuilding plan in April 2004 that was subsequently incorporated into the groundfish FMP under Amendment 16-3. The rebuilding plan established a target rebuilding year of 2038 and a harvest control rule of F = 0.0093 (with a P_{MAX} of 60%). Revision to the widow rockfish rebuilding plan is under consideration by the Council and such changes to the groundfish FMP would be enacted through Amendment 16-4; the analysis of the action is a purpose of this EIS.

4.1.1.7 Yelloweye Rockfish

Distribution and Life History

Yelloweye rockfish (*Sebastes ruberrimus*) range from the Aleutian Islands, Alaska, to northern Baja California, Mexico, and are common from Central California northward to the Gulf of Alaska (Eschmeyer, *et al.* 1983; Hart 1988; Love 1991; Miller and Lea 1972; O'Connell and Funk 1986). Yelloweye rockfish occur in water 25 m to 550 m deep with 95% of survey catches occurring from 50 m to 400 m (Allen and Smith 1988). Yelloweye rockfish are bottom dwelling, generally solitary, rocky reef fish, found either on or just over reefs (Eschmeyer, *et al.* 1983; Love 1991; Miller and Lea 1972;

O'Connell and Funk 1986). Boulder areas in deep water (>180 m) are the most densely populated habitat type, and juveniles prefer shallow-zone broken-rock habitat (O'Connell and Carlile 1993). They also reportedly occur around steep cliffs and offshore pinnacles (Rosenthal, *et al.* 1982). The presence of refuge spaces is an important factor affecting their occurrence (O'Connell and Carlile 1993).

Yelloweye rockfish are ovoviviparous and give birth to live young in June off Washington (Hart 1988). The age of first maturity is estimated at six years and all are estimated to be mature by eight years (Wyllie Echeverria 1987). They can grow to 91 cm (Eschmeyer, *et al.* 1983; Hart 1988) and males and females probably grow at the same rates (Love 1991; O'Connell and Funk 1986). The growth rate levels off at approximately 30 years of age (O'Connell and Funk 1986) but they can live to be 114 years old (Love 1991; O'Connell and Funk 1986). Yelloweye rockfish are a large predatory reef fish that usually feeds close to the bottom (Rosenthal, *et al.* 1982). They have a widely varied diet, including fish, crabs, shrimps and snails, rockfish, cods, sand lances, and herring (Love 1991). Yelloweye rockfish have been observed underwater capturing smaller rockfish with rapid bursts of speed and agility. Off Oregon the major food items of the yelloweye rockfish include cancroid crabs, cottids, righteye flounders, adult rockfishes, and pandalid shrimps (Steiner 1978). Quillback and yelloweye rockfish have many trophic features in common (Rosenthal, *et al.* 1982).

Stock Status and Management History

The first ever yelloweye rockfish stock assessment was conducted in 2001 (Wallace 2002). This assessment incorporated two area assessments: one from Northern California using CPUE indices constructed from Marine Recreational Fisheries Statistical Survey (MRFSS) sample data and CDFG data collected on board commercial passenger fishing vessels, and the other from Oregon using Oregon Department of Fish and Wildlife (ODFW) sampling data. The assessment concluded yelloweye rockfish stock biomass in 2001 was at about 7% of unexploited biomass in Northern California and 13% of unexploited biomass in Oregon. The assessment revealed a thirty-year declining biomass trend in both areas with the last above average recruitment occurring in the late 1980s. The assessment's conclusion that yelloweye rockfish biomass was well below the 25% of unexploited biomass threshold for overfished stocks led to this stock being separated from the rockfish complexes in which it was previously listed. Until 2002, when yelloweye rockfish were declared overfished, they were listed in the "remaining rockfish" complex on the shelf in the Vancouver, Columbia, and Eureka INPFC areas and the "other rockfish" complex on the shelf in the Monterey and Conception areas. As with the other overfished stocks, yelloweye rockfish harvest is now tracked separately.

In June 2002 the SSC recommended that managers should conduct a new assessment incorporating Washington catch and age data. This recommendation was based on evidence that the biomass distribution of yelloweye rockfish on the West Coast was centered in waters off Washington and that useable data from Washington were available. Based on that testimony, the Council recommended completing a new assessment in the summer of 2002, before a final decision was made on 2003 management measures. Methot et al. (Methot, *et al.* 2003) did the assessment, which was reviewed by a STAR Panel in August 2002. The assessment result was much more optimistic than the one prepared by Wallace (Wallace 2002), largely due to the incorporation of Washington fishery data. While the overfished status of the stock was confirmed (24% of unfished biomass), Methot et al. (Methot, *et al.* 2003) provided evidence of higher stock productivity than originally assumed. The assessment also treated the stock as a coastwide assemblage. This assessment was reviewed and approved by the SSC and the Council at the September 2002 Council meeting.

A yelloweye rockfish assessment was among those completed as part of the 2005 assessment cycle (Wallace, *et al.* 2005). While the assessment was scheduled to be an update, it migrated to a new modeling platform, which is allowed only in full assessments. At their November 2005 meeting, the

Council heard testimony that there were additional data sources that might inform a yelloweye assessment, but had not been included due to the terms of reference constraints on update assessments. Therefore, the Council asked the assessment team to undertake a further, full assessment effort that would include all possible sources of information.

The re-assessment of the stock (Wallace, *et al.* 2006) used the Stock Synthesis 2 model that had been introduced in the 2005 assessment. The assessment updated all data sources in the previous model, including a substantial effort to examine multiple data sources to further define and extend the historical catch stream. New data sources were also included (WDFW 2002 submersible survey and the International Pacific Halibut Commission annual longline survey). Further revisions in the assessment included reducing natural mortality from 0.045 to 0.036 and increasing steepness from 0.437 to 0.45. The assessment model treated the West Coast population of yelloweye rockfish in two different ways: as a single coastwide stock (consistent with the 2002 and 2005 assessments) and as separate and distinct sub-populations for the States of California, Oregon and Washington. The assessment is considered to be data poor, however the sparseness of data is particularly acute in the Washington model. As such, the SSC recommended to the Council that the coastwide model be used for setting the optimum yield (OY) of the stock. During the March 2006 meeting, the Council deliberated over which of the past assessments represented the best available science for use in decision-making; the Council selected the coastwide model from the 2006 assessment. Under this model, the 2006 coastwide biomass is calculated to be at 17.7% of the unfished level (with depletion rates of 8.5%, 21.8% and 20.8% for California, Oregon and Washington respectively). The rebuilding analysis (Tsou and Wallace 2006) re-estimated other parameters: Tmax increased to 2096 with a harvest control rule of F=0.0101, and a projected OY in 2007 of 12.6 mt.

The yelloweye assessment can be categorized as quite data poor; it relies primarily on recreational CPUE information with varying data gaps even in those data series among the three states. Very little fishery independent information exists. Additionally, since retention of yelloweye has been prohibited in recreational fisheries; even the limited CPUE series that do exist were truncated in 2001. In order to resolve the uncertainty in the current assessment as well as to track rebuilding, it will be necessary to implement additional strategies to collect yelloweye abundance information.

In 2004, a yelloweye rebuilding plan was adopted by the Council and submitted for incorporation in the groundfish FMP under Amendment 16-3. The rebuilding plan established a target rebuilding year of 2058 and a harvest control rule of F = 0.0153 (with a P_{MAX} of 80%). Revision to the yelloweye rockfish rebuilding plan is under consideration by the Council and such changes to the groundfish FMP would be enacted through Amendment 16-4; the analysis of the action is a purpose of this EIS.

4.1.2 Precautionary Zone Groundfish Species

Groundfish species managed under the FMP with an estimated spawning stock biomass less than 40% of its unfished level, but greater than 25% of its unfished level are categorized as species managed in the "precautionary zone". A depleted species is managed under its rebuilding plan even if it has partially rebuilt to above $B_{25\%}$; it remains under its rebuilding plan until it is assessed to have attained the B_{MSY} abundance level of 40% of unfished biomass. Precautionary zone species are managed using the 40-10 adjustment in which the OY is set less than the ABC, as described earlier in this chapter; depleted species are managed under the mortality schedule specified in rebuilding plans.

4.1.2.1 Cabezon (in Waters off California)

Distribution and Life History

Cabezon (*Scorpaenichthys marmoratus*) are distributed along the entire West Coast of the continental United States. They range from central Baja California north to Sitka, Alaska {Quast 1968; Miller and Lea 1972; Love et al. 1996}. Cabezon are primarily a nearshore species found intertidally and among jetty rocks, out to depths of greater than 100 m {Miller and Lea 1972; Love et al. 1996}.

Cabezon are known to spawn in recesses of natural and manmade objects, and males are reported to show nest-guarding behavior (Garrison and Miller 1982). Spawning is protracted, and there appears to be a seasonal progression of spawning that begins off California in winter and proceeds northward to Washington by spring. Spawning off California peaks in January and February {O'Connell 1953} while spawning in Puget Sound (Washington State) occurs for up to 10 months (November-August), peaking in March–April {Lauth 1987}. Laid eggs are sticky and adhere to the surface where deposited. After hatching, the young of the year spend 3–4 months as pelagic larvae and juveniles. Settlement takes place after the young fish have attained 3–5 cm in length {O'Connell; 1953; Lauth 1987}. It is apparent that females lay multiple batches in different nests, but whether these eggs are temporally distinct enough to qualify for separate spawning events is not understood {O'Connell 1953; Lauth 1987}.

Stock Status and Management History

The status and future prospects of cabezon were first assessed in 2003 (Cope, *et al.* 2004). The assessment delineated two stocks (north and south) at the Oregon-California border, a distinction based on differences in the catch history, CPUE trends and biological parameters (mainly growth) between the two areas. Due to the lack of data on the northern population, the assessment focused on only the southern population. As with most nearshore groundfish stocks, this assessment lacked a fishery-independent index of abundance, and consequently relied on recreational CPUE indices and information about larval abundance. The 2003 depletion level of cabezon off California was estimated at 34.7% (under the base-case posterior density function, or MPD, point estimate).

In the 2005 assessment (Cope and Punt 2006), the California cabezon stock was further divided north and south of Point Conception into the northern California substock (NCS) and the southern California substock (SCS). Historically, the recreational fishery has been the primary source of removals of cabezon in California; however commercial catches have become a major source of removals in the last ten years because of the developing live-fish fishery. Recreational removals were reconstructed back to 1916, when the commercial fishery began. When investigating the uncertainty related to the various data sources, Cope and Punt determined that excluding the mean weight value for the recreational man-made fleet for 2000 led to a major reduction in the status of the SCS (to 5.8% of virgin biomass in 2005); the use of this data point may be the most important uncertainty of the SCS assessment. The unfished spawning biomass of the California cabezon substocks were estimated to be 1110 (NCS) and 251 (SCS) mt, with estimated reproductive outputs of 445 (NCS) and 71 (SCS) mt in 2005; this leads to an estimated depletion level of 40.1% (NCS) and 28.3% (SCS). Although the assessment provides information on two substocks within California, cabezon are managed on a coastwide basis for the state. The assessment authors noted that regional management is an important consideration for relatively sedentary nearshore reef species such as cabezon and that future assessments should continue to provide scientific analyses on increasingly finer spatial scales in order to investigate such a potential shift in management.

4.1.2.2 Petrale Sole

Distribution and Life History

Petrale sole (*Eopsetta jordani*) are found from Cape Saint Elias, Alaska to Coronado Island, Baja California, Mexico. The range may possibly extend into the Bering Sea, but the species is rare north and west of southeast Alaska and in the inside waters of British Columbia (Garrison and Miller 1982; Hart 1988). Nine separate breeding stocks have been identified, although stocks intermingle on summer feeding grounds (Hart 1988; NOAA 1990). Of these nine, one occurs off British Columbia, two off Washington, two off Oregon, and four off California. Adults are found from the surf line to 550 m depth, but their highest abundance is deeper than 300 m. Adults migrate seasonally between deepwater winter spawning areas to shallower spring feeding grounds. They show an affinity to sand, sandy mud, and occasionally muddy substrates (NOAA 1990).

Spawning occurs over the continental shelf and continental slope to as deep as 550 m. Spawning occurs in large spawning aggregations in the winter. Eggs are pelagic and juveniles and adults are demersal (Garrison and Miller 1982). Eggs and larvae are transported from offshore spawning areas to nearshore nursery areas by oceanic currents and wind. Larvae metamorphose into juveniles at six months (22 cm) and settle to the bottom of the inner continental shelf (Pearcy, *et al.* 1977). Petrale sole tend to move into deeper water with increased age and size. Petrale sole begin maturing at three years. Half of males mature by seven years (29 cm to 43 cm) and half of the females are mature by eight years (>44 cm) {Pearcy et al. 1977; Pedersen 1975a; Pedersen 1975b}. Near the Columbia River, petrale sole mature one to two years earlier {Pedersen 1975a; Pedersen 1975b}.

Larvae are planktivorous. Small juveniles eat mysids, sculpins, and other juvenile flatfishes. Large juveniles and adults eat shrimps and other decapod crustaceans, as well as euphausiids, pelagic fishes, ophiuroids, and juvenile petrale sole {Garrison and Miller 1982; Hart 1988; Pearcy et al. 1977; Pedersen 1975a; Pedersen 1975b}. Petrale sole eggs and larvae are eaten by planktivorous invertebrates and pelagic fishes. Juveniles are preyed upon (sometimes heavily) by adult petrale sole, as well as other large flatfishes. Adults are preyed upon by sharks, demersally feeding marine mammals, and larger flatfishes and pelagic fishes (NOAA 1990). Petrale sole competes with other large flatfishes. It has the same summer feeding grounds as lingcod, English sole, rex sole, and Dover sole (NOAA 1990).

Stock Status and Management History

Petrale sole are harvested almost exclusively by bottom trawls in the U.S. West Coast groundfish fisheries. Petrale sole fishing grounds range from Cape Flattery off northern Washington, to Point Conception off southern California. Recent petrale sole catch statistics exhibit marked seasonal variation, with substantial portions of the annual harvest taken from the spawning grounds in December and January. Petrale sole off the U.S. West Coast have been managed historically using a coastwide ABC which represents the sum of ABCs calculated for the four INPFC areas.

In 2005, an assessment of the petrale sole stock in U.S. waters off California, Oregon, and Washington was completed {Lai et al. 2005}. Previous assessments of petrale sole in the U.S. Vancouver and Columbia INPFC areas had been conducted by Demory {1984}, Turnock et al. {1993}, and Sampson and Lee {1999}. In this assessment, petrale sole in the Eureka, Monterey and Conception INPFC areas (the Southern assessment area) are assessed separately from those in the U.S. Vancouver and Columbia areas (the Northern assessment area). Although genetic information and stock structure are not well known for this species, the available data on growth, CPUE, and geographical distribution along the U.S. Pacific coast support the use of two separate assessment areas. The assessment used the length-and-age structured Stock Synthesis 2 (SS2) Model.

Petrale sole in the north was estimated to be at 34% of unfished spawning stock biomass in 2005. In the south, the stock was estimated to be at 29% of unfished spawning stock biomass. Biomass trends were qualitatively similar in both areas, and also showed consistency with petrale sole trends in Canadian waters. Both stocks were estimated to have been below the Pacific Council's overfished threshold of 25% of unfished biomass from the mid-1970s until very recently. Estimated harvest rates were in excess of the target fishing mortality rate of F40% during this period as well. Petrale sole in both areas showed large recent increases in stock size, which is consistent with the strong upward trend in the shelf survey biomass index. In comparison to previous assessments of petrale sole, this assessment represents a significant change in our perception of petrale sole stock status. For example, in the 1999 assessment, spawning biomass stock biomass in 1998 was estimated to be at 39% of unfished stock biomass. The current assessment now estimates biomass in 1998 to have been at 12% of unfished stock biomass.

4.1.2.3 Sablefish

Distribution and Life History

Sablefish, or black cod, (*Anoplopoma fimbria*) are distributed in the Northeastern Pacific Ocean from the southern tip of Baja California, northward to the north-central Bering Sea and in the Northwestern Pacific Ocean from Kamchatka, southward to the northeastern coast of Japan. Although few studies have critically evaluated issues regarding the stock structure of this species, it appears there may exist at least three different stocks of sablefish along the West Coast of North America: (1) a stock that exhibits relatively slow growth and small maximum size that is found south of Monterey Bay {Phillips and Imamura 1954; Cailliet et al. 1988}; (2) a stock that is characterized by moderately fast growth and large maximum size that occurs from northern California to Washington {Fujiwara and Hankin 1988a; Methot 1994, 1995}; and (3) a stock that grows very quickly and contains individuals that reach the largest maximum size of all sablefish in the Northeastern Pacific Ocean, distributed off British Columbia, Canada and in the Gulf of Alaska {Mason et al. 1983; McFarlane and Beamish 1990; Methot 1995}. Large adults are uncommon south of Point Conception {Hart 1988; Love 1991; McFarlane and Beamish 1983a; McFarlane and Beamish 1983b; NOAA 1990}. Adults are found as deep as 1,900 m, but are most abundant between 200 m and 1,000 m {Beamish and McFarlane 1988; Kendall and Matarese 1987; Mason et al. 1983}. Off Southern California , sablefish are abundant to depths of 1,500 m (MBC 1987). Adults and large juveniles commonly occur over sand and mud {McFarlane and Beamish 1983a; NOAA 1990} in deep marine waters. They were also reported on hard-packed mud and clay bottoms in the vicinity of submarine canyons (MBC 1987).

Spawning occurs annually in the late fall through winter in waters greater than 300 m (Hart 1988; NOAA 1990). Sablefish are oviparous with external fertilization (NOAA 1990). Eggs hatch in about 15 days {Mason et al. 1983; NOAA 1990} and are demersal until the yolk sac is absorbed {Mason et al. 1983}. Age-zero juveniles become pelagic after the yolk sac is absorbed. Older juveniles and adults are benthopelagic. Larvae and small juveniles move inshore after spawning and may rear for up to four years {Boehlert and Yoklavich 1985; Mason et al. 1983}. Older juveniles and adults inhabit progressively deeper waters. Estimates indicate that 50% of females are mature at five years to six years (24 inches) and 50% of males are mature at five years (20 inches).

Sablefish larvae prey on copepods and copepod nauplii. Pelagic juveniles feed on small fishes and cephalopods—mainly squids {Hart 1988; Mason et al. 1983}. Demersal juveniles eat small demersal fishes, amphipods, and krill (NOAA 1990). Adult sablefish feed on fishes like rockfishes and octopus {Hart 1988; McFarlane and Beamish 1983a}. Larvae and pelagic juvenile sablefish are heavily preyed upon by seabirds and pelagic fishes. Juveniles are eaten by Pacific cod, Pacific halibut, lingcod, spiny dogfish, and marine mammals, such as Orca whales {Cailliet et al. 1988; Hart 1988; Love 1991; Mason et al. 1983; NOAA 1990}. Sablefish compete with many other co-occurring species for food, mainly Pacific cod and spiny dogfish (Allen 1982).

Stock Status and Management History

Formal stock assessments of sablefish began in 1984. The first coastwide-established regulations on the sablefish fishery off the U.S. Pacific coast were implemented as trip limits in October 1982. Since 1982, the sablefish fishery has been managed intensively, with limited-entry and open-access programs used in various manners to limit catches.

In 2001, two assessments were completed and reviewed by a STAR panel: one by NMFS (Schirripa and Methot 2001) and one by the Pacific Groundfish Conservation Trust (Hilborn, *et al.* 2001). The two assessments were in agreement, and the Council adopted the NMFS assessment for management purposes. The Schirripa and Methot assessment focused on evaluating the sensitivity of the model and the outcomes to changes in the survey data. These changes include the combining of the AFSC slope survey data and the NWFSC Industry Co-operative Survey data using a statistical GLM procedure. This analysis made it possible to extend the southern boundary of the assessment south to Point Conception (34°27' N latitude) rather than 36° N latitude, used in previous assessments. The assessment indicated a normal decline in biomass since the late 1970s due to the fishing down of the unfished stock and an unexpected decline in recruitment during the early 1990s. It introduced, for the first time, the possibility that sablefish recruitment may be linked to environmental factors. A seemingly meaningful relationship was demonstrated between changes in northern and southern copepod abundances and sablefish recruitment. Conditions and projections in the model considered two competing "states of nature" to calculate the mean virgin recruitment: a "density-dependent" state that used the average of 1975-1991 recruitments, and a "regime shift" state that used the 1975-2000 recruitments. To account for this uncertainty, the Council adopted a 2002 ABC based on the proxy harvest rate ($F_{45\%}$,) adjusted to reflect the distribution north and south of 36° N. This was done because a plan amendment would be needed to change the management area since groundfish FMP Amendment 14, permit stacking, specified only the area north of 36° N latitude.

The Council also wanted to verify industry reports of a large abundance of juvenile sablefish, an observation that was confirmed to some extent by preliminary results from the 2001 NMFS slope survey. Based on these considerations, the Council recommended a new expedited assessment be done in 2002. This update assessment (Schirripa 2002), by definition, sought to document changes in the estimates of the status of the stock by only considering newly available data for 2001 while not considering any new changes in the model structure or model assumptions. The expedited assessment confirmed fishermen's anecdotal reports of a large 1999 year class, which was also apparent in the preliminary results of the 2001 slope survey. This assessment also suggested that a relatively strong year class was produced in 2000.

The 2005 assessment (Schirripa 2006) made several changes to the format used in the previous full assessment. Landings were either taken from written records or reconstructed back to the year 1900 (the assumed model start date of the fishery). Inspection of length compositions from the AFSC and the NWFSC slope surveys led to the conclusion that the two surveys had different gear selectivities. Consequently, a separation of the data was maintained and the surveys used individually. Sufficient observer data was available in which to estimate discards from all three fisheries. To compliment these discards rates, a release mortality function based on sea surface temperature was developed from which to estimate dead discards by each of the three fisheries. Pursuing the connection between ocean conditions and recruitment, the model fit a relationship between sea level and recruitment deviations for the period 1973-2003 and used that relationship to hindcast recruitment variability back to 1925. The

2005 assessment found that spawning stock biomass has steadily declined since 1900 and suggested that there is little evidence that recruitment from 2001-2005 was as high as that for the strong 1999 and 2000 year classes. As a result, the assessment's biomass projections indicate a short-term increase, followed by a continued decline. With an estimate of current spawning biomass of 75,070 mt (compared to an unfished spawning biomass of 218,860 mt), the 2005 depletion is estimated to be 34.3%

4.1.3 Healthy Groundfish Species

4.1.3.1 Arrowtooth Flounder

Distribution and Life History

Arrowtooth flounder (*Atheresthes stomias*) range from the southern coast of Kamchatka to the northwest Bering Sea and Aleutian Islands to San Simeon, California. Arrowtooth flounder is the dominant flounder species on the outer continental shelf from the western Gulf of Alaska to Oregon. Eggs and larvae are pelagic; juveniles and adults are demersal (Garrison and Miller 1982; NOAA 1990). Juveniles and adults are most commonly found on sand or sandy gravel substrates, but occasionally occur over low-relief rock-sponge bottoms. Arrowtooth flounder exhibit a strong migration from shallow water summer feeding grounds on the continental shelf to deep water spawning grounds over the continental slope (NOAA 1990). Depth distribution may vary from as little as 50 m in summer to more than 500 m in the winter (Garrison and Miller 1982; NOAA 1990; Rickey 1995).

Arrowtooth flounder are oviparous with external fertilization. Spawning may occur deeper than 500 m off Washington (Rickey 1995). Larvae eat copepods, their eggs, and copepod nauplii (Yang 1995; Yang and Livingston 1985). Juveniles and adults feed on crustaceans (mainly ocean pink shrimp and krill) and fish (mainly gadids, herring, and pollock) (Hart 1988; NOAA 1990). Arrowtooth flounder exhibit two feeding peaks, at noon and midnight.

Stock Status and Management History

The West Coast stock of arrowtooth flounder was last assessed in 1993 {Rickey 1993}. The stock is scheduled for a full assessment in the 2007-2008 stock assessment cycle, which will inform the 2009-2010 management specifications process.

4.1.3.2 Bank Rockfish

Distribution and Life History

Bank rockfish (*Sebastes rufus*) are found from Newport, Oregon, to central Baja California, Mexico, most commonly from Fort Bragg southward (Love 1992). Bank rockfish occur offshore (Eschmeyer, *et al.* 1983) from depths of 31 m to 247 m (Love 1992), although adults prefer depths over 210 m (Love, *et al.* 1990). Observations of commercial catches indicate juveniles occupy the shallower part of the species range (Love et al. 1990). Bank rockfish are a midwater, aggregating species and are found over hard bottoms (Love 1992), over high relief or on bank edges (Love, *et al.* 1990), and along the ledge of Monterey Canyon (Sullivan 1995). They also frequent deep water over muddy or sandy bottoms {Miller and Lea 1972a}. Spawning occurs from December to May (Love, *et al.* 1990). Peak spawning of bank rockfish in the Southern California Bight occurs in January and a month later in Central and Northern California. Off California, bank rockfish are multiple brooders (Love, *et al.* 1990). Females grow to a larger maximum size (50 cm) than males (44 cm), but grow at a slightly slower rate (Cailliet, *et al.* 1996). Males reach first maturity at 28 cm, 50% maturity at 31 cm, and 100% at 38 cm. Females reach first maturity at 31 cm, 50% at 36 cm, and 100% maturity at 39 cm (Love, *et al.* 1990). Bank rockfish are midwater feeders, eating mostly gelatinous planktonic organisms such as tunicates, but also preying on small fishes and krill (Love 1992).

4.1.3.3 Black Rockfish

Distribution and Life History

Black rockfish (*Sebastes melanops*) are found from Southern California (San Miguel Island) to the Aleutian Islands (Amchitka Island) and they occur most commonly from San Francisco northward {Hart 1988; Miller and Lea 1972a; Phillips 1957; Stein and Hassler 1989}. Black rockfish occur from the surface to greater than 366 m; however, they are most abundant at depths less than 54 m (Stein and Hassler 1989). Off California, black rockfish are found along with the blue, olive, kelp, black-and-yellow, and gopher rockfishes (Hallacher and Roberts 1985). The abundance of black rockfish in shallow water declines in the winter and increases in the summer (Stein and Hassler 1989). Densities of black rockfish decrease with depth during both the upwelling and non-upwelling seasons (Hallacher and Roberts 1985; PFMC 1996). Off Oregon, larger fish seem to be found in deeper water (20 m to 50 m) (Stein and Hassler 1989). Black rockfish off the northern Washington coast and outer Strait of Juan de Fuca exhibit no significant movement. However, fish appear to move from the Central Washington coast southward to the Columbia River, but not into waters off Oregon. Movement displayed by black rockfish off the northern Oregon coast is primarily northward to the Columbia River (Culver 1986). Black rockfish form mixed sex, midwater schools, especially in shallow water (Hart 1988; Stein and Hassler 1989). Black rockfish larvae and young juveniles (<40 mm to 50 mm) are pelagic, but are benthic at larger sizes (Laroche and Richardson 1980).

Black rockfish have internal fertilization and annual spawning (Stein and Hassler 1989). Parturition occurs from February through April off British Columbia, January through March off Oregon, and January through May off California (Stein and Hassler 1989). Spawning areas are unknown, but spawning may occur in offshore waters because gravid (egg-carrying) females have been caught well offshore (Dunn and Hitz 1969; Hart 1988; Stein and Hassler 1989). Black rockfish can live to be more than 20 years in age. The maximum length attained by the black rockfish is 60 cm (Hart 1988; Stein and Hassler 1989). Off Oregon, black rockfish primarily prey on pelagic nekton (anchovies and smelt) and zooplankton such as salps, mysids, and crab megalops. Off Central California, juveniles eat copepods and zoea, while adults prey on juvenile rockfish, euphausiids, and amphipods during upwelling periods. During periods without upwelling they primarily consume invertebrates. Black rockfish feed almost exclusively in the water column (Culver 1986). Black rockfish are known to be eaten by lingcod and yelloweye rockfish (Stein and Hassler 1989).

Stock Status and Management History

The most recent black rockfish assessment was completed in 2003 and pertains to the portion of the coastwide stock occurring off the coasts of Oregon and California {Ralston and Dick 2003}. Previous assessments had been completed for the portion of the stock occurring in waters between Cape Falcon (Oregon) and the US-Canada border. Alternative harvest levels in the 2003 assessment were ranged to capture the major uncertainty of historical landings prior to 1978. Black rockfish catches prior to 1945 were assumed to be zero in the assessment. Many gaps in historical landings of black rockfish since 1945 were evident, and these landings were reconstructed using a variety of data sources. The base model assumed cumulative landings of black rockfish from all fisheries was 17,100 mt from 1945 to

1977. The projected 2005-2006 harvest specifications for black rockfish in the waters off Oregon and California used this base case catch scenario. The northern California-Oregon stock of black rockfish was concluded to be in healthy condition; its 2002 spawning output, estimated to be at 49% of its unexploited spawning level, meant that the stock as well above the management target level of $B_{40\%}$.

Black rockfish are scheduled to be assessed in the 2007-2008 stock assessment cycle, which will inform the 2009-2010 management specifications process.

4.1.3.5 California Scorpionfish

Distribution and Life History

California scorpionfish (*Scorpaena guttata*), also known locally as sculpin, is a generally benthic species found from central California to the Gulf of California in depths between the inter-tidal and about 170 m {Eschmeyer et al., 1983; Love et al., 1987}. It generally inhabits rocky reefs, but in certain areas and seasons it aggregates over sandy or muddy substrate {Frey, 1971; Love et al., 1987}. Catch rate analysis and tagging studies show that most, but not all, California scorpionfish migrate to deeper water to spawn during May-September {Love et al., 1987}. Tagging data suggest that they return to the same spawning site {Love et al. 1987}, but information is not available on non-spawning season site fidelity. California scorpionfish are quite mobile and may not be permanently tied to a particular reef {Love et al. 1987}.

California scorpionfish spawn from May through August, peaking in July {Love et al. 1987}. The species is oviparous, producing floating, gelatinous egg masses in which the eggs are embedded in a single layer {Orton 1955}. California scorpionfish utilize the "explosive breeding assemblage" reproductive mode in which fish migrate to, and aggregate at traditional spawning sites for brief periods {Love et al. 1987}. These spawning aggregations have been targeted by fishermen. Few California scorpionfish are mature at 1 year of age, but over 50% are mature by age two and most are mature by age three {Love et al. 1987}.

The species feeds on a wide variety of foods, including crabs, fishes, octopi, isopods and shrimp, but juvenile *Cancer* crabs are the most important prey {Limbaugh, 1955; Love et al., 1987}.

Stock Status and Management History

Before the 2005 assessment (Maunder et al. 2006), no assessment had been carried out for California scorpionfish. Given that in most years, 99% or more of the landings occur in the southern California ports, only the stock off of southern California is assessed. Although a substantial, but unknown, proportion of the stock is in Mexican waters, this assessment truncates the stock to the south at the international border. Data used in the model (SS2 version 1.18) included commercial and recreational landings, a fishery dependent CPUE statistic determined from analysis of CPFV logbook trip data from 1980-1999, a fishery independent index of abundance determined from trawl surveys carried out by the sanitation districts, and length-frequency data from the hook and line and trawl commercial fisheries, the recreational fishery, and the sanitation district trawl surveys. Based on the life history characteristics of the species (e.g. using "explosive" breeding assemblages), and limited information on related species, a steepness value of 0.7 was assumed for the assessment. The assessment noted that there is a large amount of variation in recruitment levels and recent recruitments are estimated to be substantially higher than average. Predictions of future biomass will be dependent on what recruitment level is assumed in the future. The estimate of the 2004 stock status was sensitive to the inclusion of the sanitation index in the stock assessment; removing the sanitation index reduced the current biomass level. The STAR Panel and STAT Team gave relative probabilities to models including and excluding the sanitation index of 74% and 26%, respectively. Including the sanitation index, the assessment estimated the 2005 biomass to be at 80% of its unfished level.

4.1.3.6 Chilipepper Rockfish

Distribution and Life History

Chilipepper rockfish (*Sebastes goodei*) are found from Magdalena Bay, Baja California, Mexico, to as far north as the northwest coast of Vancouver Island, British Columbia {Allen 1982; Hart 1988; Miller and Lea 1972a}. Chilipepper have been taken as deep as 425 m, but nearly all in survey catches were taken between 50 and 350 m (Allen and Smith 1988). Adults and older juveniles usually occur over the shelf and slope; larvae and small juveniles are generally found near the surface. In California, chilipepper are most commonly found associated with deep, high relief rocky areas and along cliff drop-offs (Love, *et al.* 1990), as well as on sand and mud bottoms (MBC 1987). They are occasionally found over flat, hard substrates (Love, *et al.* 1990). Love {1991} does not consider this to be a migratory species. Chilipepper may travel as far as 45 m off the bottom during the day to feed {Love 1991}.

Chilipeppers are ovoviviparous and eggs are fertilized internally (Reilly, *et al.* 1992). Chilipepper school by sex just prior to spawning (MBC 1987). In California, fertilization of eggs begins in October and spawning occurs from September to April (Oda 1992) with the peak occurring during December to January (Love, *et al.* 1990). Chilipepper may spawn multiple broods in a single season (Love, *et al.* 1990). Females of the species are significantly larger, reaching lengths of up to 56 cm (Hart 1988). Males are usually smaller than 40 cm (Dark and Wilkins 1994). Males mature at two years to six years of age, and 50% are mature at three years to four years. Females mature at two years to five years with 50% mature at three years to four years (MBC 1987). Females may attain an age of about 27 years, whereas the maximum age for males is about 12 years (MBC 1987).

Larval and juvenile chilipepper eat all life stages of copepods and euphausiids, and are considered to be somewhat opportunistic feeders (Reilly, *et al.* 1992). In California, adults prey on large euphausiids, squid, and small fishes such as anchovies, lanternfish, and young Pacific whiting (Hart 1988; Love, *et al.* 1990). Chilipepper are found with widow rockfish, greenspotted rockfish, and swordspine rockfish (Love, *et al.* 1990). Juvenile chilipepper compete for food with bocaccio, yellowtail rockfish, and shortbelly rockfish (Reilly, *et al.* 1992).

Stock Status and Management History

Chilipepper rockfish were last assessed in 1998 {Ralston et al. 1998}, at which time the stock was estimated to be at 46% to 61% of unfished biomass. Due to constraints of co-occurring overfished species, the catch of chilipepper rockfish has reduced to incidental levels. Chilipepper rockfish is scheduled for a full assessment in the 2008-2009 stock assessment cycle.

4.1.3.7 Dover Sole

Distribution and Life History

Dover sole (*Microstomus pacificus*) are distributed from the Navarin Canyon in the northwest Bering Sea and westernmost Aleutian Islands to San Cristobal Bay, Baja California, Mexico (Hagerman 1952; Hart 1988; NOAA 1990). Dover sole are a dominant flatfish on the continental shelf and slope from Washington to Southern California. Adults are demersal and are found from 9 m to 1,450 m, with highest abundance below 200 m to 300 m (Allen and Smith 1988). Adults and juveniles show a high affinity toward soft bottoms of fine sand and mud. Juveniles are often found in deep nearshore waters. Dover sole are considered to be a migratory species. In the summer and fall, mature adults and juveniles can be found in shallow feeding grounds, as shallow as 55 m off British Columbia (Westrheim and Morgan 1963). By late fall, Dover sole begin moving offshore into deep waters (400 m or more) to spawn. Although there is an inshore-offshore seasonal migration, little north-south coastal migration occurs (Westrheim and Morgan 1963).

Spawning occurs from November through April off Oregon and California (Hart 1988; NOAA 1990; Pearcy, *et al.* 1977) in waters 80 m to 550 m depth at or near the bottom (Hagerman 1952; Hart 1988; Pearcy, *et al.* 1977). Dover sole are oviparous and fertilization is external. Larvae are planktonic and are transported to offshore nursery areas by ocean currents and winds for up to two years. Settlement to benthic living occurs mid-autumn to early spring off Oregon, and February through July off California (Markle, *et al.* 1992). Juvenile fish move into deeper water with age and begin seasonal spawning and feeding migrations upon reaching maturity.

Dover sole larvae eat copepods, eggs, and nauplii, as well as other plankton. Juveniles and adults eat polychaetes, bivalves, brittlestars, and small benthic crustaceans. Dover sole feed diurnally by sight and smell (Dark and Wilkins 1994; Gabriel and Pearcy 1981; Hart 1988; NOAA 1990). Dover sole larvae are eaten by pelagic fishes like albacore, jack mackerel and tuna, as well as sea birds. Juveniles and adults are preyed upon by sharks, demersally feeding marine mammals, and to some extent by sablefish (NOAA 1990). Dover sole compete with various eelpout species, rex sole, English sole, and other fishes of the mixed species flatfish assemblage (NOAA 1990).

Stock Status and Management History

Dover sole have been the target of trawl operations along the West Coast of North America since World War II and were almost certainly caught prior to the war as incidental take in directed fisheries for English sole and petrale sole. Almost all of the harvests have been taken by groundfish trawl, and in particular as part of the DTS (Dover sole, shortspine thornyhead, longspine thornyhead, and sablefish) trawl fishery. Annual landings from U.S. waters averaged 6,700 mt during the 1960s, 12,800 mt during the 1970s, 18,400 mt during the 1980s, 12,400 mt during the 1990s, and 7,200 mt since 2000. Discarding of small, unmarketable fish is an important, but poorly documented feature of the fishery.

The 1997 Dover sole stock assessment (Brodziak, *et al.* 1997) treated the entire population from the Monterey area through the U.S./Vancouver area as a single stock based on research addressing the genetic structure of the population. Under a range of harvest policies and recruitment scenarios, the 1997 model projected that spawning biomass would increase from the estimated year-end level in 1997 through the year 2000 due to growth of the exceptionally large 1991 year class and to the lower catches observed in the fishery since 1991.Dover sole were next assessed in 2001, resulting in an estimated spawning stock size of 29% of the unexploited biomass (Sampson and Wood 2001). Although there was no clear trend in abundance, stocks steadily declined from the 1950s until the mid-1990s. The 1991 year class was the last strong one, consistent with the 1997 assessment. The 2001 assessment authors projected five years of Dover sole harvest levels based on preferred, optimistic, and pessimistic projections of recruitment. These options varied the harvest rate from $F_{40\%}$ (the current F_{MSY} proxy) to $F_{50\%}$. The Council adopted an ABC of 8,510 mt and an OY of 7,440 mt in 2005 and 2006, which was calculated using the current F_{MSY} proxy and the 40-10 adjustment.

A new Dover sole assessment was done in 2005 {Sampson 2006} which indicated the stock was above target levels and had an increasing abundance trend. The final base model estimated the unexploited spawning stock biomass to be slightly less than 300,000 mt and spawning biomass at the start of 2005 was estimated to be about 189,000 mt, equivalent to 63% of the unexploited level. Spawning biomass and age 5+ biomass (roughly corresponding to the exploitable biomass) were estimated to have reached their lowest points in the mid-1990s and have been rising steadily since. The estimated increases in biomass since the mid-1990s are due primarily to strong year classes in 1990 and 1991, and exceptionally strong year classes in 1997 and 2000.

4.1.3.8 English Sole

Distribution and Life History

English sole (*Parophrys vetulus*) are found from Nunivak Island in the southeast Bering Sea and Agattu Island in the Aleutian Islands, to San Cristobal Bay, Baja California Sur, Mexico (Allen and Smith 1988). In research survey data, nearly all occurred at depths greater than 250 m (Allen and Smith 1988). Adults and juveniles prefer soft bottoms composed of fine sands and mud (Ketchen 1956), but also occur in eelgrass habitats (Pearson and Owen 1992). English sole use nearshore coastal and estuarine waters as nursery areas (Krygier and Pearcy 1986; Rogers, *et al.* 1988). Adults make limited migrations. Those off Washington show a northward post-spawning migration in the spring on their way to summer feeding grounds and a southerly movement in the fall (Garrison and Miller 1982). Tagging studies have identified separate stocks based on this species' limited movements and meristic characteristics (Jow 1969).

Spawning occurs over soft-bottom mud substrates (Ketchen 1956) from winter to early spring, depending on the stock. Eggs are neritic and buoyant, but sink just before hatching (Hart 1988); juveniles and adults are demersal (Garrison and Miller 1982). Small juveniles settle in the estuarine and shallow nearshore areas all along the coast, but are less common in southerly areas, particularly south of Point Conception. Large juveniles commonly occur up to depths of 150 m. Although many postlarvae may settle outside of estuaries, most will enter estuaries during some part of their first year of life (Gunderson, *et al.* 1990). Some females mature as three-year-olds (26 cm), but all females over 35 cm long are mature. Males mature at two years (21 cm).

Larvae are planktivorous. Juveniles and adults are carnivorous, eating copepods, amphipods, cumaceans, mysids, polychaetes, small bivalves, clam siphons, and other benthic invertebrates {Allen 1982; Becker 1984; Hogue and Carey 1982; Simenstad et al. 1979}. English sole feed primarily by day, using sight and smell, and sometimes dig for prey (Allen 1982; Hulberg and Oliver 1979). A juvenile English sole's main predators are probably piscivorous birds such as great blue heron (*Ardia herodias*), larger fishes, and marine mammals. Adults may be eaten by marine mammals, sharks, and other large fishes.

Stock Status and Management History

English sole have been captured by the bottom trawl fishery operating off the western coast of North

America for over a century. Stewart {2006} found that peak catches from the southern area occurred in the 1920s with a maximum of 3,976 mt of English sole landed in 1929, and peak catches from the northern area occurred in the 1940s to the 1960s with a maximum of 4,008 mt landed in 1948. Landings from both areas have generally declined since the mid 1960s and have been at nearly historical lows in recent years

The most recent stock assessment of English sole prior the current 2005 assessment was performed in 1993 {Sampson 1993}, using an earlier version of the Stock Synthesis program {Methot 1989}. That assessment considered the female portion of the stock off Oregon and Washington during the years 1977-1993. The English sole spawning biomass was found to be increasing and it was concluded that the fishery was sustainable at (then) contemporary harvest levels.

The 2005 assessment of English sole {Stewart 2006} modeled a single coastwide stock, although both commercial and fishery independent data sources were treated separately for a southern (INPFC Conception and Monterey) and a northern (INPFC Eureka, Columbia and U.S. Vancouver) area. The assessment found that English sole spawning biomass has increased rapidly over the last decade after a period of poor recruitments from the mid 1970s to the mid 1990s, which left the stock at nearly historically low levels. Strong year classes were estimated for 1995, 1996, and 1999. The data indicate that the 1999 year class may be the largest in the time-series, although the magnitude is somewhat uncertain because the assessment contains no age data subsequent to 2000. There is substantial uncertainty related to certain parameters in the assessment, specifically biomass, recruitment, and relative depletion, as indicated by the wide confidence intervals for those parameters. Nevertheless, sensitivity analyses indicated that the conclusion that current spawning biomass exceeds the target level ($B_{40\%}$) was robust to all three of these sources of uncertainty. The spawning biomass at the beginning of 2005 was estimated to be 31,379 mt, which corresponds to 91.5% of the unexploited equilibrium level. Current (2004) total catches were estimated to be 1,341 mt, of which 950 mt were landed.

4.1.3.9 Lingcod

Distribution and Life History

Lingcod (*Ophiodon elongatus*), a top order predator of the family Hexagrammidae, ranges from Baja California, Mexico, to Kodiak Island in the Gulf of Alaska. Lingcod are demersal at all life stages (Allen and Smith 1988; NOAA 1990; Shaw and Hassler 1989). Adult lingcod prefer two main habitat types: slopes of submerged banks 10 m to 70 m below the surface with seaweed, kelp, and eelgrass beds and channels with swift currents that flow around rocky reefs (Emmett, *et al.* 1991; Giorgi and Congleton 1984; NOAA 1990; Shaw and Hassler 1989). Juveniles prefer sandy substrates in estuaries and shallow subtidal zones (Emmett, *et al.* 1991; Forrester and Thomson 1969; Hart 1988; NOAA 1990). As the juveniles grow they move to deeper waters. Adult lingcod are considered a relatively sedentary species, but there are reports of migrations of greater than 100 km by sexually immature fish {Jagielo 1990; Mathews and LaRiviere 1987; Matthews 1992; Smith et al. 1990}.

Mature females live in deeper water than males and move from deep water to shallow water in the winter to spawn {Forrester 1969; Hart 1988; Jagielo 1990; LaRiviere et al. 1980; Mathews and LaRiviere 1987; Matthews 1992; Smith et al. 1990}. Mature males may live their whole lives associated with a single rock reef, possibly out of fidelity to a prime spawning or feeding area (Allen and Smith 1988; Shaw and Hassler 1989). Spawning generally occurs over rocky reefs in areas of swift current {Adams 1986; Adams and Hardwick 1992; Giorgi and Congleton 1984; LaRiviere et al. 1980}. After the females leave the spawning grounds, the males remain in nearshore areas to guard the nests until the eggs hatch. Hatching occurs in April off Washington, but as early as January and as late as

June at the geographic extremes of the lingcod range. Males begin maturing at about two years (50 cm), whereas females mature at three plus years (76 cm). In the northern extent of their range, fish mature at an older age and larger size {Emmett et al. 1991; Hart 1988; Mathews and LaRiviere 1987; Miller and Geibel 1973; Shaw and Hassler 1989}. The maximum age for lingcod is about 20 years (Adams and Hardwick 1992).

Lingcod are a visual predator, feeding primarily by day. Larvae are zooplanktivores (NOAA 1990). Small demersal juveniles prey upon copepods, shrimps, and other small crustaceans. Larger juveniles shift to clupeids and other small fishes (Emmett, *et al.* 1991; NOAA 1990). Adults feed primarily on demersal fishes (including smaller lingcod), squids, octopi, and crabs {Hart 1988; Miller and Geibel 1973; Shaw and Hassler 1989}. Lingcod eggs are eaten by gastropods, crabs, echinoderms, spiny dogfish, and cabezon. Juveniles and adults are eaten by marine mammals, sharks, and larger lingcod {Miller and Geibel 1973; NOAA 1990}.

Stock Status and Management History

Lingcod have been a target of commercial fisheries since the early 1900's in California, and since the late 1930's in Oregon and Washington waters. Recreational fishermen have targeted lingcod since the 1920's in California. A smaller recreational fishery has taken place in Washington and Oregon since at least the 1970's. Although historically the catches of lingcod have been greater in the commercial sector than in the recreational sector, this pattern has been reversed since the late 1990's.

In 1997, U.S. scientists assessed the size and condition of the portion of the stock in the Columbia and Vancouver areas (including the Canadian portion of the Vancouver management area), and concluded the stock had fallen to below 10% of its unfished size (Jagielo, *et al.* 1997). The Council responded by imposing substantial harvest reductions coastwide, reducing the harvest targets for the Eureka, Monterey, and Conception areas by the same percentage as in the north. In 1999, scientists assessed the southern portion of the stock and concluded the condition of the southern stock was similar to the northern stock, thus confirming the Council had taken appropriate action to reduce harvest coastwide (Adams, *et al.* 1999). Based on these assessments, the lingcod stock was declared overfished in 1999.

Jagielo {2000} conducted a coastwide lingcod assessment and determined the total biomass increased from 6,500 mt in the mid-1990s to about 8,900 mt in 2000. In the south, the population had also increased slightly from 5,600 mt in 1998 to 6,200 mt in 2000. In addition, the assessment concluded previous aging methods portrayed an older population; whereas new aging efforts showed the stock to be younger and more productive. Therefore, the ABC and OY were increased in 2001 on the basis of the new assessment. A revised rebuilding analysis of coastwide lingcod (Jagielo and Hastie 2001) was adopted by the Council in September 2001. It confirmed the major conclusions of the 2000 assessment and rebuilding analysis, but slightly modified recruitment projections to stay on the rebuilding trajectory to reach target biomass in 2009. This modification resulted in a slight decrease in the 2002 ABC and OY.

A coastwide assessment for lingcod was completed in 2003 {Jagielo et al. 2003} and approved by the Council in March 2004 for use in setting harvest specifications for the 2005-2006 biennium. This assessment updated the previous coastwide lingcod assessment {Jagielo 2000}. As in the previous assessment, separate age-structured assessment models were constructed for northern areas (Columbia and U.S.-Vancouver areas) and southern areas (Conception, Monterey, and Eureka areas). Results from these two models were combined to obtain coastwide estimates of spawning biomass, the depletion level, and other relevant assessment outputs. This assessment indicated that the lingcod stock had achieved the rebuilding objective of $B_{40\%}$ in the north (actually 28% above $B_{40\%}$), but was at $B_{31\%}$ in the south. However, the adopted lingcod rebuilding plan specified a coastwide rebuilding objective. The

Council's SSC, working in concert with the lead assessment author, recalculated the coastwide lingcod stock status in March 2004 using actual 2003 harvests (the assessment, which was completed during 2003, assumed harvest would be equal to the specified OY in 2003). Their calculations indicated that the spawning biomass at the start of 2004 was within 99.3% of B_{MSY} (or $B_{40\%}$) on a coastwide basis. Therefore, the Council could not recommend to NMFS that the stock should be declared rebuilt. The lingcod rebuilding plan was adopted by the Council and incorporated into the groundfish FMP under Amendment 16-2. The rebuilding plan had established a target rebuilding year of 2009 and the harvest control rule of F = 0.0531 for fisheries in the northern areas and F = 0.0610 for fisheries in the southern areas (with a PMAX of 60%). However the 2003 assessment {Jagielo et al. 2003} was then used to recalculate the harvest control rule .to be F = 0.17 for fisheries in the northern areas and F = 0.15 for fisheries in the southern areas.

The 2005 assessment {Jagielo and Wallace 2005} used the Stock Synthesis II program and, as in previous lingcod assessments, constructed separate models of the stock for northern and southern areas. With respect to uncertainty within the assessment, the authors pointed in particular to the estimation of assessment parameters for the southern (LCS) model due to the sparseness of data (in particular, the short time series of fishery age data and small sample sizes). On a coastwide basis, the lingcod population was concluded to be fully rebuilt, given that the spawning biomass in 2005 was estimated to be 64% of its unfished level (B_{2005}=34,017 mt; B_0= 52,850 mt). Within the separate area models, current biomass is closer to unfished biomass in the north (87% of B_0) than in the south (24% of B_0). Given that the lingcod stock is managed on a coastwide basis, the Council announced the lingcod stock to be fully rebuilt in 2005, which is four years earlier than the target rebuilding year established in the rebuilding plan.

4.1.3.10 Longspine Thornyhead

Distribution and Life History

Longspine thornyhead (*Sebastolobus altivelis*) are found from the southern tip of Baja California, Mexico, to the Aleutian Islands {Eschmeyer et al. 1983; Jacobson and Vetter 1996; Love 1991; Miller and Lea 1972; Smith and Brown 1983}, but are abundant from Southern California northward {Love 1991}. Juvenile and adult longspine thornyhead are demersal and occupy the benthic surface (Smith and Brown 1983). Off Oregon and California, longspine thornyhead mainly occur at depths of 400 m to 1,400 plus m, most between 600 m and 1,000 m in the oxygen minimum zone (Jacobson and Vetter 1996). Thornyhead larvae (*Sebastolobus* spp.) have been taken in research surveys up to 560 km off the California coast (Cross 1987; Moser, *et al.* 1993). Juveniles settle on the continental slope at about 600 m to 1,200 m (Jacobson and Vetter 1996). Longspine thornyhead live on soft bottoms, preferably sand or mud {Eschmeyer et al. 1983, Jacobson and Vetter 1996, Love 1991}. Longspine thornyheads neither school nor aggregate (Jacobson and Vetter 1996).

Spawning occurs in February and March at 600 m to 1,000 m {Jacobson and Vetter 1996, Wakefield and Smith 1990}. Longspine thornyhead are oviparous and are multiple spawners, spawning two to four batches per season {Love 1991, Wakefield and Smith 1990}. Eggs rise to the surface to develop and hatch. Floating egg masses can be seen at the surface in March, April, and May (Wakefield and Smith 1990). Juveniles (<5.1 cm long) occur in midwater (Eschmeyer, *et al.* 1983). After settling, longspine thornyhead are completely benthic (Jacobson and Vetter 1996). Longspine thornyhead can grow to 38 cm {Eschmeyer et al. 1983, Jacobson and Vetter 1996, Miller and Lea 1972} and live more than 40 years (Jacobson and Vetter 1996). Longspine thornyhead reach the onset of sexual maturity at 17 cm to 19 cm total length (10% of females mature) and 90% are mature by 25 cm to 27 cm (Jacobson and Vetter 1996).

Longspine thornyhead are ambush predators (Jacobson and Vetter 1996). They consume fish fragments, crustaceans, bivalves, and polychaetes and occupy a tertiary consumer level in the food web. Pelagic juveniles prey largely on herbivorous euphausiids and occupy a secondary consumer level in the food web {Love 1991, Smith and Brown 1983}. Longspine thornyhead are commonly found in shortspine thornyhead stomachs. Cannibalism in newly settled longspine thornyhead may occur, because juveniles settle directly onto adult habitat (Jacobson and Vetter 1996). Sablefish commonly prey on longspine thornyhead.

Stock Status and Management History

Longspine thornyhead are exploited in the limited entry deep-water trawl fishery operating on the continental slope that also targets shortspine thornyhead, Dover sole and sablefish (called the DTS fishery). A very small proportion of longspine landings is due to non-trawl gears (gillnet, hook and line). Longspine and shortspine thornyhead make up a single market category, however they have been managed under separate harvest specifications since 1992. The thornyhead fishery developed in Northern California during the 1960s. The fishery then expanded north and south, and the majority of the landings of longspine thornyhead have since been in the Monterey, Eureka, and Columbia INPFC areas, with some increase in landings from the Conception (southern CA) and Vancouver (northern WA) INPFC areas in recent years (Fay 2006).

Longspine thornyhead were assessed for the fourth time in 2005 (Fay 2006); the previous assessment was conducted in 1997 {Rogers et al. 1997}. The model assumed one coastwide stock with one coastwide trawl fishery. Data sources included commercial landings and length composition, three sources of discard rates, and biomass indices and length composition information from the Alaska Fisheries Science Center and Northwest Fisheries Science Center slope surveys. Results from the base model suggested that the length compositions from the slope surveys were influencing recruitment in the model, such that the model estimated slightly higher recruitment in the early 1990s, which then declined in the mid to late 1990s. The spawning biomass in 2005 was approximately 71% of unfished spawning biomass, but this estimate is highly uncertain as is evident in the comparatively large 95% confidence interval for the spawning biomass. A suite of sensitivity analyses bracketed some of the areas of uncertainty in catchability, selectivity, mortality and steepness that formed a basis for considering and discussing major areas of uncertainty for the decision table.

4.1.3.11 Pacific Whiting

Distribution and Life History

Pacific whiting (*Merluccius productus*), also known as Pacific hake, are a semi-pelagic merlucciid (a cod-like fish species) that range from Sanak Island in the western Gulf of Alaska to Magdalena Bay, Baja California Sur, Mexico. They are most abundant in the California Current System {Bailey 1982; Hart 1988; Love 1991; NOAA 1990}. Smaller populations of Pacific whiting occur in several of the larger semi-enclosed inlets of the northeast Pacific Ocean, including the Strait of Georgia, Puget Sound, and the Gulf of California {Bailey et al. 1982; Stauffer 1985}. The highest densities of Pacific whiting are usually between 50 m and 500 m, but adults occur as deep as 920 m and as far offshore as 400 km {Bailey 1982; Bailey et al. 1982; Dark and Wilkins 1994; Dorn 1995; Hart 1988; NOAA 1990}. Pacific whiting school at depth during the day, then move to the surface and disband at night for feeding (McFarlane and Beamish 1986; Sumida and Moser 1984; Tanasich, *et al.* 1991). Coastal stocks spawn off Baja, California in the winter, then the mature adults begin moving northward and inshore following food supply and Davidson Currents (NOAA 1990). Pacific whiting reach as far north as southern British Columbia by fall. They then begin a southern migration to spawning grounds further offshore {Bailey et al. 1982; Dorn 1995; Smith 1995; Stauffer 1985}.

Spawning occurs from December through March, peaking in late January {Smith 1995}. Pacific whiting are oviparous with external fertilization. Eggs of the Pacific whiting are neritic and float to neutral buoyancy {Bailey 1982; Bailey et al. 1982; NOAA 1990}. Hatching occurs in five days to six days, and within three months to four months juveniles are typically 35 mm (Hollowed 1992). Juveniles move to deeper water as they get older (NOAA 1990). Females mature at three years to four years (34 cm to 40 cm) and nearly all males are mature by three years (28 cm). Females grow more rapidly than males after four years; growth ceases for both sexes at 10 years to 13 years {Bailey et al. 1982}.

All life stages feed near the surface late at night and early in the morning (Sumida and Moser 1984). Larvae eat calanoid copepods, as well as their eggs and nauplii (McFarlane and Beamish 1986; Sumida and Moser 1984). Juveniles and small adults feed chiefly on euphausiids (NOAA 1990). Large adults also eat amphipods, squid, herring, smelt, crabs, and sometimes juvenile whiting {Bailey 1982; Dark and Wilkins 1994; McFarlane and Beamish 1986; NOAA 1990}. Eggs and larvae of Pacific whiting are eaten by pollock, herring, invertebrates, and sometimes Pacific whiting. Juveniles are eaten by lingcod, Pacific cod, and rockfish species. Adults are preyed on by sablefish, albacore, pollock, Pacific cod, marine mammals, soupfin sharks, and spiny dogfish (Fiscus 1979; McFarlane and Beamish 1986; NOAA 1990).

Stock Status and Management History

The history of the coastal whiting fishery is characterized by rapid changes brought about by the development of foreign fisheries in 1966, joint-venture fisheries in the early 1980s, and domestic fisheries in 1990s. The coastwide (U.S. and Canada) whiting stock is assessed annually by a joint technical team of scientists from both countries. The 2001 assessment (Helser, *et al.* 2002) incorporated 2001 hydroacoustic survey data and showed the spawning stock biomass declined substantially and had been lower during the past several years than previously estimated. The stock assessment estimated the biomass in 2001 was 0.7 million mt, and the female spawning biomass was less than 20% of the unfished biomass. This was substantially lower than indicated in the 1998 assessment (Dorn, *et al.* 1999), which estimated the biomass to be at 39% of its unfished biomass. Therefore, NMFS declared the whiting stock overfished in April 2002. The stock was projected to be near 25% of the unfished biomass in 2002 and above $B_{25\%}$ in 2003.

The 2004 whiting stock assessment (Helser, *et al.* 2004), incorporating new data from the 2003 hydro-acoustic survey, estimated the spawning stock biomass at the beginning of 2004 between 47% and 51% of unfished biomass; the stock was therefore declared rebuilt. Furthermore, because the 1999 year class was larger than previously estimated, estimates of the 2001 biomass in this assessment ranged from 27% to 33% of unfished biomass, indicating that the stock approached, but never fell below, the $B_{25\%}$ minimum stock size threshold (Whiting STAR Panel 2004).

The 2005 whiting stock assessment considered two alternative and equally plausible models based on the value for the catchability coefficient (q) for the hydroacoustic survey, q=1 and q=0.6. Within a stock assessment model, a higher catchability coefficient brings about a lower the estimate of current biomass. Under the base model (q=1), which the Council adopted, the 2004 coastwide depletion level was estimated to be 0.50 (given that age 3+ biomass was estimated to be 2.5 million mt in 2004).

Unlike the 2005 assessment, the 2006 assessment was based on the stock assessment package Stock Synthesis 2. The assessment considered two alternative and equally plausible models based on the value for the catchability coefficient (*q*) for the hydroacoustic survey, q=1 and q=0.69. One of these values (*q*=1) is the same as that included in the 2005 assessment. The second value, q=0.69, was estimated taking into account a prior distribution on *q* selected by the STAR Panel. Although the SSC endorsed the option of combining of results from both models (giving each model equal weight) to form the basis for management advice, the Council adopted 2006 ABC and OY values based on the base model that used the more conservative q=1 value. The base model estimated the depletion level of the coastwide stock to be 31%. The assessment reinforced the importance of the 1999 year class, noting that it was the single most dominate cohort since the late 1980s and it in large part supported fishery catches during the last few years; over the coming years its proportion within the overall stock will decrease, however, and therefore the spawning biomass is predicted to decline in the future for almost any level of harvest.

4.1.3.12 Shortbelly Rockfish

Distribution and Life History

Shortbelly rockfish (*Sebastes jordani*) are found from San Benito Islands, Baja California, Mexico, to La Perouse Bank, British Columbia (Eschmeyer, *et al.* 1983; Lenarz 1980). The habitat of the shortbelly rockfish is wide ranging (Eschmeyer, *et al.* 1983). Shortbelly rockfish inhabit waters from 50 m to 350 m in depth (Allen and Smith 1988) on the continental shelf (Chess, *et al.* 1988) and upper-slope (Stull and Tang 1996). Adults commonly form very large schools over smooth bottoms near the shelf break (Lenarz 1992). Shortbelly rockfish have also been observed along the Monterey Canyon ledge (Sullivan 1995). During the day shortbelly rockfish are found near the bottom in dense aggregations. At night they are more dispersed (Chess, *et al.* 1988). During the summer shortbelly rockfish tend to move into deeper waters and to the north as they grow, but they do not make long return migrations to the south in the winter to spawn (Lenarz 1980).

Shortbelly rockfish are viviparous, bearing advanced yolk sac larvae {Ralston et al. 1996a}. Shortbelly rockfish spawn off California during January through April (Lenarz 1992). Larvae metamorphose to juveniles at 27 mm and appear to begin forming schools at the surface at that time (Laidig, *et al.* 1991; Lenarz 1980). A few shortbelly rockfish mature at age two, while 50% are mature at age three, and nearly all are mature by age four (Lenarz 1992). They live to be about ten years old (Lenarz 1980; MacGregor 1986) with the maximum recorded age being 22 years (Lenarz 1992).

Shortbelly rockfish feed primarily on various life stages of euphausiids and calanoid copepods both during the day and night {Chess et al. 1988; Lenarz et al. 1991}. Shortbelly rockfish play a key role in the food chain as they are preyed upon by Chinook and coho salmon, lingcod, black rockfish, Pacific whiting, bocaccio, chilipepper, pigeon guillemots, western gull, marine mammals, and other taxa (Chess, *et al.* 1988; Eschmeyer, *et al.* 1983; Hobson and Howard 1989; Lenarz 1980).

4.1.3.13 Shortspine Thornyhead

Distribution and Life History

Shortspine thornyhead (*Sebastolobus alascanus*) are found from northern Baja California, Mexico, to the Bering Sea and occasionally to the Commander Islands north of Japan (Jacobson and Vetter 1996). They are common from Southern California northward {Love 1991}. Shortspine thornyhead inhabit areas over the continental shelf and slope (Erickson and Pikitch 1993; Wakefield and Smith 1990). Although they can occur as shallow as 26 m (Eschmeyer, *et al.* 1983), shortspine thornyhead mainly occur in depths between 100 m and 1,400 m off Oregon and California, most commonly between 100 m to 1,000 m (Jacobson and Vetter 1996).

Spawning occurs in February and March off California (Wakefield and Smith 1990). Shortspine thornyhead are thought to be oviparous (Wakefield and Smith 1990), although there is no clear evidence to substantiate this (Erickson and Pikitch 1993). Eggs rise to the surface to develop and hatch. Larvae are pelagic for about 12 months to 15 months. During January to June, juveniles settle onto the continental shelf and then move into deeper water as they become adults (Jacobson and Vetter 1996). Off California, they begin to mature at five years; 50% are mature by 12 years to 13 years; and all are mature by 28 years (Owen and Jacobson 1992). Although it is difficult to determine the age of older individuals, Owen and Jacobson {1992} report that off California, they may live to over 100 years of age. The mean size of shortspine thornyhead increases with depth and is greatest at 1,000 m to 1,400 m (Jacobson and Vetter 1996).

Benthic individuals are ambush predators that rest on the bottom and remain motionless for extended periods of time (Jacobson and Vetter 1996). Off Alaska, shortspine thornyhead eat a variety of invertebrates such as shrimps, crabs, and amphipods, as well as fishes and worms (Owen and Jacobson 1992). Longspine thornyhead are a common item found in the stomachs of shortspine thornyhead. Cannibalism of newly settled juveniles is important in the life history of thornyheads (Jacobson and Vetter 1996).

Stock Status and Management History

Shortspine thornyhead are a major component of the deepwater fishery on the continental slope, especially the trawl fishery for Dover sole, thornyheads, and sablefish (referred to as the DTS complex). The species is one of the most numerous components of the slope ecosystem; however, this is an especially long-lived species and cannot sustain aggressive harvest rates. It is taken coincidentally with Dover sole, sablefish, and longspine thornyhead, especially in the upper slope and lower shelf; in deeper water, longspine thornyhead is a more predominate species. The two thornyhead species are often difficult to distinguish, and historical landings data combine the two into a single category; nevertheless, the species have been managed under separate harvest specifications since 1992.

The assessment of shortspine thornyhead in 1997 covered the area from Central California at 36° N latitude to the U.S./Canada border {Rogers et al. 1997}. The STAR Panel expressed concern that management requires more detailed information on thornyheads than could be obtained from the available data. In 1998, two separate stock assessments covering the area north of 36°N latitude were prepared and accepted by the Council(NMFS STAT and OT STAT 1998; Rogers, *et al.* 1998). A synthesis of these two assessments was used to set the harvest specifications 1999 and 2000; given that the synthesis estimated 1999 depletion at 32% of virgin biomass, the Council used the precautionary 40-10 policy to set the OYs for those two years.

There were a range of uncertainties in the 2001 assessment of shortspine thornyhead, in 2001, not the least of which was the estimated biomass {Piner and Methot 2001}. The assessment was extended south to Point Conception (in contrast to past surveys, which were limited to stocks north of the 36° N latitude management area boundary). The authors concluded the 2001 spawning biomass ranged between 25% and 50% of unexploited spawning biomass. As was also the case in the 1998 assessment (Rogers, *et al.* 1998), the uncertainty in abundance largely revolved around the uncertainty in recruitment and survey *q*, or catchability, of shortspine thornyhead in slope surveys. The authors also concluded that the trend in stock biomass was increasing and the stock was not overfished. Based on estimated biomass and application of the GMT-recommended F=0.75M principle (which approximates an $F_{50\%}$ proxy harvest rate for shortspine thornyhead), the assessment authors and GMT recommended a slight increase in the ABC and OY for 2002. They also recommended that the harvest specifications be set for two areas divided by Pt. Conception (34°27'N latitude), rather than the previous policy to separate the management areas at the Conception-Monterey border (36°N latitude). Despite the uncertainty in biomass estimates and determination of whether shortspine thornyhead should be treated as a precautionary zone" stock, these recommendations did treat the stock as such by applying the 40-10 adjustment.

The 2005 assessment {Hamel 2006} extended the southern border of the assessment area from Pt. Conception to the Mexican border (32.5ºN). Including the entire Conception area resulted in a larger basis for unfished biomass, given that this area was estimated to contain nearly half of the stock's total West Coast biomass. Another key modeling change from the previous assessment was to model the slope surveys as having dome-shaped selectivity. Because of the sparseness and quality of the data, natural mortality, steepness and the catchability coefficient were all fixed. The catchability coefficient for the slope survey was fixed at q=1 based on findings by Lauth et al {2004}. The STAR Panel {Barnes et al. 2006} noted that because the supporting data and subsequent assessment were just marginally sufficient to estimate the resource status, the biological reference points (e.g. biomass levels) should be considered with caution. The assessment estimated the spawning biomass for 2005 to be 63% of unfished abundance, with a weakly falling recent trend. It was also noted that there could be regional management concerns with this stock because while the assessment OY is coastwide, there are differences in historic exploitation rates north and south of Point Conception.

4.1.3.14 Splitnose Rockfish

Distribution and Life History

Splitnose rockfish (*Sebastes diploproa*) occur from Prince William Sound, Alaska to San Martin Island, Baja California, Mexico {Miller and Lea 1972}). Splitnose rockfish occur from zero m to 800 m, with most survey catches occurring in depths of 100 m to 450 m (Allen and Smith 1988). The relative abundance of juveniles (<21 cm) is quite high in the 91 m to 272 m depth zone and then decreases sharply in the 274 m to 475 m depth zone {Boehlert 1980}. Splitnose rockfish have a pelagic larval stage, a prejuvenile stage, and a benthic juvenile stage {Boehlert 1977}. Benthic splitnose rockfish associate with mud habitats {Boehlert 1980}. Young occur in shallow water, often at the surface under drifting kelp (Eschmeyer, *et al.* 1983). The major types of vegetation juveniles are found under are *Fucus* spp. (dominant), eelgrass, and bull kelp (Shaffer, *et al.* 1995). Juvenile splitnose rockfish off Southern California are the dominant rockfish species found under drifting kelp {Boehlert 1977}.

Splitnose rockfish are ovoviviparous and release yolk sac larvae {Boehlert 1977}. They may have two parturition seasons, or may possibly release larvae throughout the year {Boehlert 1977}. In general, the main parturition season get progressively shorter and later toward the north {Boehlert 1977}. Splitnose rockfish growth rates vary with latitude, being generally faster in the north. Splitnose rockfish mean sizes increase with depth in a given latitudinal area. Mean lengths of females are generally greater than males {Boehlert 1980}. Off California, 50% maturity occurs at 21 cm, or five years of age, whereas off British Columbia 50% of males and females are mature at 27 cm (Hart 1988). Adults can achieve a maximum size of 46 cm {Boehlert 1980, Eschmeyer et al. 1983, Hart 1986}. Females have surface ages to 55 years and section ages to 81 years.

Adult splitnose rockfish off Southern California feed on midwater plankton, primarily euphausiids (Allen 1982). Juveniles feed mainly on planktonic organisms, including copepods and cladocerans during June and August. In October, their diets shift to larger epiphytic prey and are dominated by a single amphipod species. Juvenile splitnose rockfish actively select prey (Shaffer, *et al.* 1995) and are probably diurnally active (Allen 1982). Adults are probably nocturnally active, at least in part (Allen 1982).

4.1.3.15 Starry Flounder

Distribution and Life History

Starry flounder have a very broad geographic distribution around the rim of the north Pacific Ocean and have been recorded from Los Angeles to the Aleutian Islands, although they are rare south of Point Conception (Kramer and O'Connell 1995; Orcutt 1950). Off the West Coast of the United States starry flounder are found commonly in nearshore waters, especially in the vicinity of estuaries (Baxter 1999; Kimmerer 2002; NOAA 1991; Orcutt 1950; Pearson 1989; Sopher 1974). It has a quite shallow bathymetric distribution, with most individuals occurring in waters less than 80 m, although specimens have been collected off the continental shelf in excess of 350 m {Orcutt 1950, Kramer et al. 1995}. They are most often found on gravel, clean shifting sand, hard stable sand, and mud substrata.

Spawning occurs primarily during the winter months of December and January, at least in central California (Orcutt 1950); it may occur somewhat later in the year (February-April) off British Columbia and Washington {Hart 1973; Love 1996}. Egg/larval development apparently takes about 2-3 months to occur. Offspring principally remain within the estuaries until age 2, when many have migrated to the adjacent ocean habitats (Baxter 1999; Kimmerer 2002; Orcutt 1950). Reproductive maturity occurs at age-2 yr for males and age-3 yr for females, when the fish are 28 cm and 35 cm, respectively. Tagging studies have shown that fish are relatively sedentary and move little during their adult lives {Love 1996}, however there is little information on regional variation in stock structure.

Starry flounder consume crabs, shrimps, worms, clams and clam siphons, other small mollusks, small fishes, nemertean worms, and brittle stars (Hart 1973).

Stock Status and Management History

The U.S. West Coast starry flounder stock was first assessed in 2005 {Ralston 2006}. The assessment is based on the assumption of separate biological populations north and south of the CA / OR border; it uses catch data, relative abundance indices derived from trawl logbook data, and an index of age-1 abundance from trawl surveys in the San Francisco Bay and Sacramento-San Joaquin River estuary. Unlike most other groundfish stock assessments, no age- or length-composition data are directly used in the assessment. Both the northern and southern populations are estimated to be above the target level of 40% of virgin spawning biomass (44% of SB_0 in Washington-Oregon and 62% in California), although the status of this data-poor species remains fairly uncertain compared to that of many other groundfish species. One of the most significant areas of uncertainty in the assessment is the estimate of natural mortality rate, which was quite high (0.30 yr^{-1} for females and 0.45 yr^{-1} for males).

4.1.3.16 Yellowtail Rockfish

Distribution and Life History

Yellowtail rockfish (*Sebastes flavidus*) range from San Diego, California, to Kodiak Island, Alaska {Fraidenburg 1980; Gotshall 1981; Lorz et al. 1983; Love 1991; Miller and Lea 1972a; Norton and MacFarlane 1995}. The center of yellowtail rockfish abundance is from Oregon to British Columbia

(Fraidenburg 1980). Yellowtail rockfish are a common, demersal species abundant over the middle shelf {Carlson and Haight 1972; Fraidenburg 1980; Tagart 1991; Weinberg 1994}. Yellowtail rockfish are most common near the bottom, but not on the bottom {Love 1991; Stanley et al. 1994}. Yellowtail rockfish adults are considered semi-pelagic {Stanley et al. 1994; Stein et al. 1992} or pelagic, which allows them to range over wider areas than benthic rockfish (Pearcy 1992). Adult yellowtail rockfish occur along steeply sloping shores or above rocky reefs {Hart 1986}. They can be found above mud with cobble, boulder and rock ridges, and sand habitats; they are not, however, found on mud, mud with boulder, or flat rock {Love 1991, Stein et al. 1992}. Yellowtail rockfish form large (sometimes greater than 1,000 fish) schools and can be found alone or in association with other rockfishes {Love 1991, Pearcy 1992, Rosenthal et al. 1982, Stein et al. 1992, Tagart 1991}. These schools may persist at the same location for many years (Pearcy 1992).

Yellowtail rockfish are viviparous (Norton and MacFarlane 1995) and mate from October to December. Parturition peaks in February and March and from November to March off California {Westrheim 1975}. Young-of-the-year pelagic juveniles often appear in kelp beds beginning in April and live in and around kelp in midwater during the day, descending to the bottom at night {Love 1991, Tagart 1991}. Male yellowtail rockfish are 34 cm to 41 cm in length (five years to nine years) at 50% maturity, females are 37 cm to 45 cm (six years to ten years) (Tagart 1991). Yellowtail rockfish are long-lived and slow-growing; the oldest recorded individual was 64 years old {Fraidenburg 1981, Tagart 1991}. Yellowtail rockfish have a high growth rate relative to other rockfish species (Tagart 1991). They reach a maximum size of about 55 cm in approximately 15 years (Tagart 1991). Yellowtail rockfish feed mainly on pelagic animals, but are opportunistic, occasionally eating benthic animals as well (Lorz, *et al.* 1983). Large juveniles and adults eat fish (small Pacific whiting, Pacific herring, smelt, anchovies, lanternfishes, and others), along with squid, krill, and other planktonic organisms (euphausiids, salps, and pyrosomes) {Love 1991, Phillips 1964, Rosenthal et al. 1982, Tagart 1991}.

Stock Status and Management History

Until the late 1990's, yellowtail rockfish were harvested as part of a directed midwater trawl fishery. However because it co-occurs with several other rockfishes, including the overfished species canary rockfish and widow rockfish {Nagtegaal 1983; Tagart 1987; Rogers and Pikitch 1992}, yellowtail rockfish fishing opportunity has been substantially curtailed. Since the end of 2002, there have been no landings limits that provide directed mid-water fishing opportunities for yellowtail rockfish in non-tribal trawl fisheries.

The stock assessment of yellowtail rockfish was most recently updated in 2005 (Wallace and Lai 2006). The last full assessment of the northern stock areas was conducted in 2000 {Tagart et al. 2000}, and it was then updated in 2003 {Lai et al. 2003}. The Council manages the U.S. fishery as two stocks separated at Cape Mendocino, California; as in the past, the 2005 update assessment includes only the northern stock (which is divided for assessment purposes into three areas: South Vancouver, Northern Columbia, and Eureka/South Columbia). The purpose of an assessment update is to add the most recent data into the model used in the full assessment. This update, therefore, continued the use of the age-structured model written with AD Model Builder software and extended the various data time series. Abundance trends were estimated to be somewhat different by area (little trend in South Vancouver and declining trends in the other areas). However following the recommendations of the SSC and 2003 STAR panel, the coastwide estimates of biomass and ABC/OY are the summation of estimates from the three assessed areas. The estimated age4+ biomass in year 2004 was 72,152 mt with a 26% CV, which is an increase from 58,025 mt in 2003. Since 1995 the spawning biomass has remained above 40% of unfished levels.

4.1.4 Unassessed Groundfish Species and Those Managed as Part of a Stock Complex

4.1.4.1 Minor Rockfish South

Southern Nearshore Species

The complex, Minor Nearshore Rockfish south of 40°10' N latitude, is further subdivided into the following management categories: 1) shallow nearshore rockfish [comprised of black and yellow rockfish (*S. chrysomelas*); China rockfish (*S. nebulosus*); gopher rockfish (*S. carnatus*); grass rockfish (*S. rastrelliger*), and kelp rockfish (*S. atrovirens*)]; 2) deeper nearshore rockfish: [comprised of black rockfish (*S. melanops*), blue rockfish (*S. mystinus*); brown rockfish (*S. auriculatus*); calico rockfish (*S. dalli*); copper rockfish (*S. caurinus*); olive rockfish (*S. serranoides*); quillback rockfish (*S. maliger*); and treefish (*S. serriceps*)] and 3) California scorpionfish (*Scorpaena guttata*).

Of the species listed above, two were assessed for the first time in 2005, gopher rockfish, and California scorpionfish. Because of this new information, California scorpionfish has been removed from the stock complex and will be managed under its individual harvest specifications beginning in 2007. However gopher rockfish cannot be managed separately from other nearshore rockfish species without significantly increasing bycatch; in addition, the assessment is considered uncertain due to its poor data quality. Gopher rockfish, therefore, will continue to be managed from within the southern minor nearshore rockfish species complex, but the information provided in the stock assessment will be used to inform the harvest specifications set for that complex.

Gopher rockfish was assessed for the first time in 2005 (Key, *et al.* 2006). Although the distribution of gopher rockfish extends south into the Southern California Bight, the assessment was restricted to the stock north of Pt. Conception. The assessment is based on landings and length composition data from commercial and recreational fisheries (primarily hook and line gear) and an index of relative abundance (catch per unit effort or CPUE) from the commercial passenger fishing vessel (CPFV) Sportfish Survey database. These data sources were used to estimate population trends from 1965 to 2004. There are no fishery-independent indices of stock biomass for gopher rockfish. Assessment results indicate an upward trend in gopher rockfish biomass since the 1980s and estimates of 2005 abundance ranged between 60% and 110% of average unfished stock size; this range of depletion levels is the result of alternative emphases in the model given to the CPFV in the CPUE index, a data element identified as a major source of uncertainty. Recent exploitation rates are estimated to have been well below the F_{MSY} proxy for rockfish.

Southern Shelf Species

The minor shelf rockfish complex south of 40°10' N latitude is composed of the following species: bronzespotted rockfish (*S. gilli*); chameleon rockfish (*S. phillipsi*); dusky rockfish (*S. ciliatus*); dwarf-red rockfish (*S. rufianus*); flag rockfish (*S. rubrivinctus*); freckled rockfish (*S. lentiginosus*); greenblotched rockfish (*S. rosenblatti*); greenspotted rockfish (*S. chlorostictus*); greenstriped rockfish (*S. elongatus*); halfbanded rockfish (*S. semicinctus*); harlequin rockfish (*S. variegatus*); honeycomb rockfish (*S. umbrosus*); Mexican rockfish (*S. macdonaldi*); pink rockfish (*S. eos*); pinkrose rockfish (*S. simulator*); pygmy rockfish (*S. wilsoni*); redstripe rockfish (*S. proriger*); rosethorn rockfish (*S. helvomaculatus*); rosy rockfish (*S. rosaceus*); silvergray rockfish (*S. brevispinis*); speckled rockfish (*S. ovalis*); squarespot rockfish (*S. hopkinsi*); starry rockfish (*S. constellatus*); stripetail rockfish (*S. saxicola*); swordspine rockfish (*S. ensifer*); tiger rockfish (*S. nigrocinctus*); vermilion rockfish (*S. miniatus*); and yellowtail rockfish (*S. flavidus*).

In 2005, vermilion rockfish was assessed for the first time. However there were significant concerns about the reliability of the assessment. Given these concerns, the SSC did not endorse the results as being suitable for setting OYs and the Council did not accept the assessment for use in management. Vermilion rockfish, therefore, is still managed within the southern minor shelf rockfish complex

Southern Slope Species

The minor slope rockfish complex south of 40°10' N latitude is composed of the following species: aurora rockfish (*S. aurora*); bank rockfish (*S. rufus*); blackgill rockfish (*S. melanostomus*); Pacific ocean perch (*S. alutus*); redbanded rockfish (*S. babcocki*); rougheye rockfish (*S. aleutianus*); sharpchin rockfish (*S. zacentrus*); shortraker rockfish (*S. borealis*); and yellowmouth rockfish (*S. reedi*).

Although blackgill rockfish has been formally assessed, it is still managed as part of the southern Sebastes complex; aggregate ABCs and OYs are established from this complex using the harvest targets of some component individual species, such as blackgill rockfish.

Blackgill rockfish landings can be attributed almost entirely to the commercial fishery in California. Since the late 1970's, hook and line has accounted for 56% of total landings in California, set nets has accounted for 12%; and trawl has accounted for 32%. The first assessment for blackgill rockfish was conducted in 1998 (Butler, *et al.* 1999). That assessment assumed a unit stock in southern and central California (Conception INPFC area) and was based on a stock reduction analysis assuming constant recruitment. The dynamics of the simple model were tuned to average mortality rates from catch curves and landings data. Fishery selectivity was assumed to mirror maturity at size/age; trends in fishable/mature biomass were then estimated.

In 2005, the second and most recent stock assessment of blackgill rockfish was completed {Helser 2006}. This assessment expanded the geographic range of that in Butler et al. {1999}, including both the Monterey and Conception INPFC areas, where over 90% of the landings have occurred. The assessment is based on catch and length composition data from commercial fisheries and indices of relative abundance and size composition from the AFSC shelf trawl survey and the AFSC slope survey. The modeling approach, Stock Synthesis 2 (Ver. 1.19), takes advantage of fishery and survey length compositions to explicitly estimate selectivity. The base model estimated depletion to be 52.3% of the unfished spawning biomass, within a range of 36% to 67% depending upon the assumed natural mortality rate (identified as a key axis of uncertainty for this stock). Assessment results indicate that recent exploitation rates have been slightly below the F_{MSY} proxy for rockfish.

4.1.4.2 Minor Rockfish North

Northern Nearshore Species

The minor nearshore rockfish complex north of 40°10' N latitude is composed of the following species: black and yellow rockfish (*S. chrysomelas*); blue rockfish (*S. mystinus*); brown rockfish (*S. auriculatus*); calico rockfish (*S. dalli*); China rockfish (*S. nebulosus*); copper rockfish (*S. caurinus*); gopher rockfish (*S. carnatus*); grass rockfish (*S. rastrelliger*); kelp rockfish (*S. atrovirens*); olive rockfish (*S. serranoides*); quillback rockfish (*S. maliger*); and treefish (*S. serriceps*).

Northern Shelf Species

The minor shelf rockfish complex north of 40°10' N latitude is composed of the following species:

bronzespotted rockfish (*S. gilli*); bocaccio (*Sebastes paucispinis*); chameleon rockfish (*S. phillipsi*); chilipepper rockfish (*S. goodei*); cowcod (*S. levis*); dusky rockfish (*S. ciliatus*); dwarf-red rockfish (*S. rufianus*); flag rockfish (*S. rubrivinctus*); freckled rockfish (*S. lentiginosus*); greenblotched rockfish (*S. rosenblatti*); greenspotted rockfish (*S. chlorostictus*); greenstriped rockfish (*S. elongatus*); halfbanded rockfish (*S. semicinctus*); harlequin rockfish (*S. variegatus*); honeycomb rockfish (*S. umbrosus*); Mexican rockfish (*S. macdonaldi*); pink rockfish (*S. eos*); pinkrose rockfish (*S. simulator*); pygmy rockfish (*S. wilsoni*); redstripe rockfish (*S. proriger*); rosethorn rockfish (*S. helvomaculatus*); rosy rockfish (*S. rosaceus*); silvergray rockfish (*S. brevispinis*); speckled rockfish (*S. ovalis*); squarespot rockfish (*S. hopkinsi*); starry rockfish (*S. constellatus*); stripetail rockfish (*S. saxicola*); swordspine rockfish (*S. ensifer*); tiger rockfish (*S. nigrocinctus*); and vermilion rockfish (*S. miniatus*).

Northern Slope Species

The minor slope rockfish complex north of 40°10' N latitude is composed of the following species: aurora rockfish (*S. aurora*); bank rockfish (*S. rufus*); blackgill rockfish (*S. melanostomus*); redbanded rockfish (*S. babcocki*); rougheye rockfish (*S. aleutianus*); sharpchin rockfish (*S. zacentrus*); shortraker rockfish (*S. borealis*); splitnose rockfish (*S. diploproa*); and yellowmouth rockfish (*S. reedi*).

4.1.4.3 Pacific Cod

Distribution and Life History

Pacific cod (*Gadus macrocephalus*) are widely distributed in the coastal north Pacific, from the Bering Sea to Southern California in the east, and to the Sea of Japan in the west. Adult Pacific cod occur as deep as 875 m (Allen and Smith 1988), but the vast majority occurs between 50 m and 300 m {Allen and Smith 1988, Hart 1986, Love 1991, NOAA 1990}. Along the West Coast, Pacific cod prefer shallow, soft-bottom habitats in marine and estuarine environments (Garrison and Miller 1982), although adults have been found associated with coarse sand and gravel substrates (Garrison and Miller 1982; Palsson 1990). Larvae and small juveniles are pelagic; large juveniles and adults are parademersal (Dunn and Matarese 1987; NOAA 1990). Adult Pacific cod are not considered to be a migratory species. There is, however, a seasonal bathymetric movement from deep spawning areas of the outer shelf and upper slope in fall and winter to shallow middle-upper shelf feeding grounds in the spring (Dunn and Matarese 1987; Hart 1988; NOAA 1990; Shimada and Kimura 1994).

Pacific cod have external fertilization {Hart 1986, NOAA 1990} with spawning occurring from late fall to early spring. Their eggs are demersal. Larvae may be transported to nursery areas by tidal currents (Garrison and Miller 1982). Half of females are mature by three years (55 cm) and half of males are mature by two years (45 cm) {Dunn and Matarese 1987, Hart 1986}. Juveniles and adults are carnivorous and feed at night (Allen and Smith 1988; Palsson 1990) with the main part of the adult Pacific cod diet being whatever prey species is most abundant (Kihara and Shimada 1988; Klovach, *et al.* 1995). Larval feeding is poorly understood. Pelagic fish and sea birds eat Pacific cod larvae, while juveniles are eaten by larger demersal fishes, including Pacific cod. Adults are preyed upon by toothed whales, Pacific halibut, salmon shark, and larger Pacific cod {Hart 1986, Love 1991, NOAA 1990, Palsson 1990}. The closest competitor of the Pacific cod for resources is the sablefish (Allen 1982).

4.1.4.4 Other Fish

The Other Fish stock complex contains all the unassessed Groundfish FMP species that are neither rockfish (family *Scorpaenidae*) nor flatfish. These species include big skate (*Raja binoculata*), California skate (*Raja inornata*), leopard shark (*Triakis semifasciata*), longnose skate (*Raja rhina*), soupfin shark (*Galeorhinus zyopterus*), spiny dogfish (*Squalus acanthias*), finescale codling (*Antimora microlepis*), Pacific rattail (*Coryphaenoides acrolepis*), ratfish (*Hydrolagus colliei*), cabezon (*Scorpaenichthys marmoratus*) (north of the California/Oregon border at 42° N latitude), and kelp greenling (*Hexagrammos decagrammus*).

Kelp greenling was assessed for the first time in 2005. Although the assessment covered both California and Oregon, the Council adopted only the Oregon substock assessment for use in management. Due to the considerable uncertainty associated with the assessment, the Council furthermore decided not to set independent harvest specifications for kelp greenling.

The first and only assessment of kelp greenling was completed in 2005 by Cope and MacCall {2006}. The assessment treated the stock as two completely independent sub-stocks divided at the California-Oregon border (excluding Washington, as there have been no substantial fisheries off its coast). There are substantial differences between the two assessments with respect to assessment period, model assumptions, results, and uncertainties. An important difference between the two sub-stocks is the first year for which historical catch data are available (1916 for California and 1981 for Oregon). The Oregon sub-stock has some age-at-length data, which were included in the assessment. The estimate of depletion for the Oregon sub-stock (the current biomass is at 49% of its unfished) is more certain than estimates of absolute abundance, which are highly imprecise. For the California sub-stock, substantial uncertainty could not be resolved regarding growth and natural mortality rates, as well as the shape of the selectivity pattern for the shore mode fishery. Due to these factors, it was not possible to formulate a model for California.

Longnose skate and spiny dogfish are each scheduled to be assessed in 2007; this will be the first stock assessment for each of these species.

4.1.4.5 Other Flatfish

The Other Flatfish complex contains all the unassessed flatfish species in the Groundfish FMP. These species include butter sole (*Isopsetta isolepis*), curlfin sole (*Pleuronichthys decurrens*), flathead sole (*Hippoglossoides elassodon*), Pacific sanddab (*Citharichthys sordidus*), rex sole (*Glyptocephalus zachirus*), rock sole (*Lepidopsetta bilineata*), and sand sole (*Psettichthys melanostictus*).

Starry flounder (*Platichthys stellatus*) has been managed as part of the Other Flatfish complex (through 2006). However, with the first assessment of starry flounder in 2005 {Ralston 2006}, the Council intends to manage this species, under the current action, with its own stock-specific ABC and OY.

4.1.5 Non-Groundfish Species

Non-groundfish species and the fisheries that target them often need to be considered in groundfish management for two reasons. First, these species may be caught incidentally in directed groundfish fisheries. Thus, management measures that change total fishing effort in groundfish fisheries could increase or decrease fishing mortality on the incidentally-caught species. Second, those fisheries targeting non-groundfish species may also incidentally catch groundfish. This source of groundfish mortality cannot be directly regulated through the groundfish FMP, as such vessels do not hold federal groundfish permits; however, its impact still must be subtracted from the overall OY for that groundfish species. Such catch accounting is particularly critical for depleted species. This section briefly describes these non-groundfish species and associated fisheries, and for certain fisheries, notes mitigation measures that have been introduced to decrease their incidental take of groundfish.

Since vessels operating within the incidental groundfish Open Access fleet do not hold licenses under the Groundfish FMP, it has been difficult to assure their compliance with closed areas established to protect depleted rockfish species (i.e. the Rockfish Conservation Areas). However a new technology adopted by the PFMC has made this accounting easier. Beginning in 2007, all commercial vessels that take and retain, possess, or land federally-managed groundfish species taken in federal waters or in state waters prior to transiting federal waters must employ Vessel Monitoring Systems (VMS). VMS is further discussed in Chapter 6.

Observer programs within the groundfish fishery are important contributions toward the accurate monitoring and recording of incidental take, including that of non-groundfish species. Standardized bycatch reporting methodologies are discussed in section 6.1.2. However one program, the Shoreside Whiting Observer Program (SWOP), is of particular relevance here. SWOP was established in 1992 to examine bycatch in the directed Pacific whiting fishery. Participating vessels must carry an exempted fishing permit (EFP) issued by NMFS, and are required to retain all catch and to land unsorted catch at designated shoreside processing plants. In return, permitted vessels are not penalized for landing prohibited species (e.g., Pacific salmon, Pacific halibut, Dungeness crab), nor are they held liable for exceeding groundfish trip limits.

4.1.5.1 Salmon

Salmon are anadromous fish, spending a part of their life in ocean waters, but returning to freshwater rivers and streams to spawn and then die. Council-managed ocean salmon fisheries mainly catch Chinook and coho salmon (*Oncorhynchus tshawytscha* and *O. kisutch*); pink salmon (*O. gorbuscha*) are also caught in odd-numbered years, principally off of Washington. For further information on the species, as well as management actions and harvest levels, see the *Review of 2005 Ocean Salmon Fisheries* {PFMC 2006}.

The salmon troll fishery has an incidental catch of Pacific halibut and groundfish; this is of particular significance with respect to canary rockfish catch and is further discussed in Section 4.3.5.1. In addition, to account for yellowtail rockfish landed incidentally while not promoting targeting on the species, a federal regulation was adopted in 2001 that allowed salmon trollers to land up to one pound of yellowtail per two pounds of salmon, not to exceed 300 pounds per month (north of Cape Mendocino).

Groundfish fisheries catch salmon incidentally. Chapter 5 (Protected Species) discusses the impacts on salmon in further detail. For both ESA-listed and non ESA-listed salmon species, incidental catch is highest in the limited entry groundfish trawl (whiting and non-whiting) sector. Bycatch of salmon by the groundfish trawl fleet is generally restricted to encounters with Chinook. Data from the West Coast Groundfish Observer Program indicated an order of magnitude drop in coastwide Chinook bycatch for non-whiting LE trawl between 2003 to 2004; the reduction can be attributed to a large degree to a decrease in nearshore trawl effort, where salmon bycatch is usually highest(Hastie 2005). On the other hand, there was an order of magnitude increase in bycatch by the whiting fishery between 2004 and 2005.

4.1.5.2 Pacific Halibut

Pacific halibut (*Hippoglossus stenolepis*) belong to a family of flounders called *Pleuronectidae*. Pacific halibut are managed by the bilateral (U.S./Canada) International Pacific Halibut Commission (IPHC) with implementing regulations set by Canada and the U.S. in their own waters. The Pacific Halibut Catch Sharing Plan for waters off Washington, Oregon, and California (Area 2A) specifies IPHC management measures for Pacific halibut on the West Coast. Implementation of IPHC catch levels and regulations is the responsibility of the Council, the states of Washington, Oregon, and California, and the Pacific halibut treaty tribes.

Of groundfish fisheries, the fixed gear sablefish fishery is responsible for the most catch of Pacific halibut. To allow landing of these halibut, the Catch Sharing Plan stipulates that when the Area 2A total allowable catch (TAC) is above 900,000 pounds, halibut may be retained in the limited entry primary sablefish fishery north of Point Chehalis, Washington (46° 53' 18" N latitude). Rockfish have been commonly caught historically in the halibut fishery. However, encounters have been significantly reduced over recent years by restricting the fishery to set depth greater than 100 fm.

4.1.5.3 Coastal Pelagic Species

Coastal Pelagic Species (CPS) are schooling fish, not associated with the ocean bottom, that migrate in coastal waters. These species include: northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), Pacific (chub) mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), and market squid (Decapoda spp.). For further information on the species, as well as management actions and harvest levels, see the 2005 CPS SAFE document {PFMC 2005}.

The catch of groundfish in CPS fisheries is negligible, and retention is prohibited. The whiting fishery accounts for a minor proportion of the catch of Pacific mackerel and jack mackerel; the federal harvest guideline for these mackerel species has not been met in recent years.

4.1.5.4 Highly Migratory Species

Highly migratory species (HMS) include tunas, billfish, dorado, and sharks—species that range great distances during their lifetime, extending beyond national boundaries into international waters and among the EEZs of many nations in the Pacific. In 2003, the Council adopted a Highly Migratory Species FMP to federally regulate the take of HMS within and outside the U.S. West Coast EEZ. The FMP {PFMC 2003c} describes management unit species in detail; these are five tuna species, five shark species, striped marlin, swordfish, and dorado (dolphinfish).

The catch of HMS in groundfish fisheries are considered to be negligible.

Using federal observer data, it was concluded that bycatch of Pacific whiting and yellowtail rockfish in the drift gillnet fishery is considered "major" (greater than ten individuals per 100 sets observed) for the period of 2001-2004 {PFMC 2006}. Also, a notable source of groundfish species mortality within the HMS fishery has been due to "mixed trips," in which a vessel operating under a VMS license also targets groundfish during a single trip. The expansion of VMS coverage into the Open Access sector has contributed significantly to the reduction of mixed trip impact on depleted species. Without the VMS requirement (which will go into effect in 2007), the activity of vessels under HMS permits within rockfish conservation areas is unknown, and it is possible that the vessels are targeting groundfish within these restricted areas. VMS is discussed in further detail in Chapter 6.

4.1.5.5 Dungeness Crab

The Dungeness crab (*Cancer magister*) is distributed from the Aleutian Islands, Alaska, to Monterey Bay, California. It lives in bays, inlets, around estuaries, and on the continental shelf. Dungeness crab is found to a depth of about 180 m. Although it is found at times on mud and gravel, this crab is most abundant on sand bottoms; frequently it occurs among eelgrass. It is typically harvested using traps (crab pots), ring nets, by hand (scuba divers), or dip nets. Dungeness crab are managed by the states of Oregon and California, and by the State of Washington in cooperation with Washington Coast treaty tribes, and with inter-state coordination through the Pacific States Marine Fisheries Commission.

Dungeness crab is taken incidentally, or harmed unintentionally, by groundfish gears. In some areas, encounter with Dungeness crab by nearshore flatfish trawls is common. These encounter rates were one of criteria the Council considered when deciding to set the nearshore RCA boundary as seaward as possible. The incidental catch of depleted groundfish species is considered to be negligible.

4.1.5.6 Greenlings, Ocean Whitefish, and California Sheephead

California sheephead (*Semicossyphus pulcher*) are a large member of the wrasse family *Labridae*. They range from Monterey Bay south to Guadalupe Island in central Baja California and the Gulf of California, in Mexico, but are uncommon north of Point Conception. They are associated with rocky bottom habitats, particularly in kelp beds to 55 m, but more commonly at depths of 3 m to 30 m. They can live to 50 years of age and a maximum length of 91 cm (16 kg). Like some other wrasse species, California sheephead change sex starting first as a female, but changing to a male at about 30 cm in length.

Ocean whitefish (*Caulolatilus princeps)* occur as far north as Vancouver Island in British Columbia, but are rare north of Central California. A solitary species, they inhabit rocky bottoms and are also found on soft sand and mud bottoms. Whitefish dig into the substrate for food.

In California, California sheephead and ocean whitefish are each managed by CDFG. Both are predominantly caught by the recreational fishery. Catch of California sheephead and ocean whitefish in the recreational fishery are restricted within the Cowcod Conservation Area to minimize interaction with cowcod.

While kelp greenling, managed under the groundfish FMP, represents the majority of the greenling that are caught; the other species, rock, painted, and white spotted greenling, are managed by the states. Minimal take of rock greenling occurs in the commercial and recreational fisheries in California. It is often taken in conjunction with fishing for federally managed groundfish, primarily nearshore rockfish and cabezon.

4.1.5.7 Pink Shrimp

Pacific pink shrimp (*Pandalus jordani*) are found from Unalaska in the Aleutian Islands to San Diego, California, at depths of 25 fm to 200 fm (46 m to 366 m). Off the U.S. West Coast these shrimp are harvested with trawl gear from Northern Washington to Central California, with the majority of the catch taken off the coast of Oregon. Pacific shrimp fisheries are managed by the states of Washington, Oregon, and California; the Council has no direct management authority.

Concentrations of pink shrimp are associated with well-defined areas of green mud and muddy-sand bottoms. Shrimp trawl nets are usually constructed with net mesh sizes smaller than the net mesh sizes for legal groundfish trawl gear. Thus, it is shrimp trawlers that commonly take groundfish in association with shrimp, rather than the reverse. In the past, the pink shrimp fishery had been responsible in some years for a significant proportion of canary rockfish incidental catch. However, such impact has been reduced to a negligible amount because of bycatch reduction devices (BRDs) that are now required on all vessels in this fishery. BRDs are added to the trawl net and divert finfish out of the codend of the net, where the shrimp catch is accumulated.

4.1.5.8 California Halibut

California halibut (*Paralichthys californicus*) are a left-eyed flatfish of the family *Bothidae*. They range from Northern Washington to southern Baja California, Mexico, (Eschmeyer, *et al.* 1983), but are most common south of Oregon. The species can be targeted by trawl vessels south of Pt. Arena, CA (38°57.50' N latitude). It is a state-managed species, and participation in the open-access fishery for California halibut does not require specific permits. California halibut is, at most, an ancillary fishery for limited-entry trawlers in California (Hastie 2005). The California halibut fishery is known to take only minimal amounts of depleted groundfish species; for example, the PFMC Groundfish Management Team estimated that, in 2005, the fishery was responsible for 0.1 mt mortality of bocaccio rockfish and 0.0 mt of all other depleted groundfish species.

4.1.5.9 Ridgeback and Spot Prawns

Ridgeback prawns (*Sicyonia ingentis*) are found from Monterey, California south to Baja California, Mexico, in depths of 145 metric feet to 525 metric feet {Sunada *et al.* 2001}. They are more abundant south of Point Conception and are the most common invertebrate appearing in trawls. Their preferred habitat is sand, shell and green mud substrate, and relatively sessile. They are prey for sea robins, rockfish, and lingcod. The Ridgeback prawn fishery occurs exclusively in California, centered in the Santa Barbara Channel and off Santa Monica Bay. The ridgeback prawn fishery is managed by the State of California and, similar to spot prawn and pink shrimp, is considered an “exempted” trawl gear in the federal open access groundfish fishery, entitling the fishery to groundfish trip limits. However, the catch of depleted groundfish in the ridgeback prawn fishery is considered to be negligible.

Spot prawn (*Pandalus platyceros*) are the largest of the pandalid shrimp and range from Baja California, Mexico, north to the Aleutian Islands and west to the Korean Strait {Larson 2001}. They inhabit rocky or hard bottoms including coral reefs, glass sponge reefs, and the edges of marine canyons. They have a patchy distribution, which may result from active habitat selection and larval transport. Spot prawn are Hermaphroditic. Spot prawn fisheries are state-managed. The use of trawl gear to target spot prawn has been banned in all three states; the spot prawn pot fishery that remains is considered to have no incidental bycatch of depleted groundfish species.

4.1.5.10 Sea Cucumbers

Two sea cucumber species are targeted commercially: the California sea cucumber (*Parastichopus californicus*), also known as the giant red sea cucumber, and the warty sea cucumber (*P. parvimensis*) (Rogers-Bennett and Ono 2001). These species are tube-shaped Echinoderms, a phylum that also includes sea stars and sea urchins. The California sea cucumber occurs as far north as Alaska, while the warty sea cucumber is uncommon north of Point Conception and does not occur north of Monterey. Both species are found in the intertidal zone to as deep as 300 feet and are bottom-dwelling organisms.

Along the West Coast, sea cucumbers are harvested by diving or trawling, and the fisheries are managed by the states. The warty sea cucumber is fished almost exclusively by divers. The California sea cucumber is caught principally by trawling in Southern California, but is targeted by divers in Northern California. The sea cucumber trawl fishery occurs over sandy flat habitat off of Santa Barbara (south of Pt. Conception), an area with no rocky outcroppings. Given that habitat, the fishery is considered to have negligible bycatch of depleted species.

4.2 Criteria Used to Evaluate Impacts

A primary goal of the groundfish FMP is to rebuild to or maintain spawning stock biomass of groundfish stocks and stock complexes at B_{MSY}. Two critical considerations in evaluating alternative harvest levels relative to accomplishing this goal are the uncertainty of management measures to limit total fishing-related mortality to prescribed levels and the uncertainty in our understanding of stock status and productivity. In other words, the risks of allowing higher harvests to provide increased socioeconomic benefits (see Chapter 7 for an evaluation of socioeconomic impacts) need to be evaluated by the effectiveness of harvest monitoring systems to accurately determine total fishing-related mortality and assessment uncertainty. An additional consideration for depleted stocks is the tradeoff of duration of rebuilding vs. the amount of allowable harvest or total fishing-related mortality. All of these considerations are used to develop criteria for evaluating biological impacts to groundfish stocks.

Systems for monitoring groundfish mortalities (landings plus discard mortalities) on the West Coast vary in their effectiveness depending on whether the species is primarily caught in commercial or recreational fisheries and how well at-sea discards are monitored. In general, fishing-related mortalities of commercially caught species are better known than those for stocks primarily caught by recreational fisheries. This is because commercial landings are recorded on fish receiving tickets, which are used to document the weight and ex-vessel value of landed catch, while recreational catches are mostly monitored using a random, stratified census of anglers. The degree of at-sea monitoring of discards also varies by fishing sector with the limited entry at-sea whiting trawl sector having the highest at-sea observer rates; followed by limited entry bottom trawl (including shoreside whiting); limited entry fixed gear; open access; California commercial passenger fishing vessels (CPFV or California recreational charter); and California (non-CPFV), Oregon, and Washington recreational. The treaty tribes report that their fisheries are observed at a high rate because their fisheries are full retention fisheries for rockfish species.

Assessment uncertainty is another evaluation criterion for evaluating stock impacts. In general, assessments of species that are adequately sampled by a reliable source of fishery independent abundance information tend to be more robust with respect to estimating stock trends and abundance {NRC, 1998}. On the West Coast, groundfish surveys have typically been conducted using bottom trawl gear randomly stratified over latitudinal and depth strata along the continental shelf and slope {Lauth 2000, Weinberg et al. 2002}[18]. The results from these surveys are typically the key inputs to the stock assessments for West Coast groundfish stock assessments. For example, indices of abundance from the triennial trawl survey were used in 15 of the 22 assessments in Table 4-2, and 7 assessments used slope survey data. These surveys are also often the source of the biological data used to estimate life history parameters. For species that are not well sampled by traditional survey data, such as cowcod and yelloweye rockfish, other temporal indices of abundance are used to tune assessments. Many such indices, particularly fishery-dependent indices such as commercial or recreational catch per unit effort (CPUE) trends, tend to be associated with higher levels of uncertainty. Fishery-dependent data are often less reliable than fishery-independent data for a variety of reasons; for example, catch rates may be

[18] The NMFS Alaska Fisheries Science Center originally implemented a full trawl survey completed every three years on the West Coast and hence called the "triennial" survey, data from this survey span from 1977 to 2004. The Alaska Center also conducted slope surveys beginning in 1984, although these surveys had varying temporal and spatial coverage. Since 1998, the NMFS Northwest Fisheries Science Center has conducted an annual bottom trawl survey of the West Coast slope, and since 2003 this survey has sampled both shelf and slope habitats. This survey (referred to as the "combined" survey) will be the key source of fishery independent information in the future. Currently, information from all of these surveys are typically used to tune West Coast groundfish stock assessments.

stable in the face of stock declines as a result of increasing fishing power or changing spatial patterns in effort {Hilborn and Walters 1992, Walters 2003}. Furthermore, management measures can substantially alter the integrity of fishery-dependent data, particularly in response to actions by managers to reduce or control effort. Consequently, assessments for data-poor species such as cowcod and yelloweye rockfish, which are based on highly uncertain catch reconstructions and recreational CPUE time series to inform biomass trends, are associated with much greater levels of uncertainty relative to other groundfish species' assessments.

As illustrated throughout section 4.1, model uncertainty is also a key factor in considering how the results of stock assessments are used. The perception of stock status and productivity for many stocks, particularly those for rebuilding species, often changes substantially between stock assessments. Such changes can be a result of a range of technical factors, including how a given assessment model is structured, the assumptions used to fix or estimate key parameters (i.e., whether parameters such as natural mortality and steepness are fixed, estimated freely, or estimated with an informative prior), and the evolution of methods for developing time series and estimates of uncertainty from different sources of raw data. As the population dynamics of target species themselves are responsive to a mix of complex (and typically poorly understood) biological, oceanographic and interspecific interactions, new sources of information (e.g., new data sets, extensions of existing data sets, incorporation of environmental factors into assessments) can also result in changes in parameter estimates and model outputs. Consequently, estimates of depletion levels and stock status can vary substantially between assessment cycles; as illustrated by the increase in the estimated OY of bocaccio from ≤20 mt to 250 mt between 2002 and 2003, and the perception from the most recent widow rockfish assessment that this stock may not have ever been below the overfished threshold of 25% of initial biomass. In such cases, the most plausible result from the assessment should still be viewed as highly uncertain and the risks associated with management decision-making should account for this uncertainty.

A logical conclusion for evaluating potential management decisions using highly uncertain assessment results is more precaution may be needed to avoid future problems if assumptions regarding stock status are overly optimistic. For example, Punt {2003} developed a simulation model to evaluate how well a particular set of management rules actually achieved management goals in the face of measurement error, process error, and model uncertainty. The study simulating the outcomes under a given set of rules for assessing progress, with regard to the number of times a rebuilding plan was revised, the average catch during the years that the resource was being rebuilt, and the ratio of the number of years that it took for a stock to rebuild over the number of years it was expected to take a stock to rebuild based on the original rebuilding plan. In general, results indicated that greater stability tended to be associated with smaller OYs (which were based on more conservative criteria for achieving success), and that frequent revisions to harvest rates that accompanied new assessments could lead to both a less stable management regime and longer overall rebuilding times.

The predicted times to rebuild the seven depleted species subject to FMP Amendment 16-4 relative to the amount of allowable harvest (to avoid significant or disastrous socioeconomic impacts to fishing communities) are determined in new rebuilding analyses recommended by the SSC in 2005 or, in the case of yelloweye rockfish, in 2006. These rebuilding analyses probabilistically evaluate allowable harvest vs. rebuilding duration relative to the maximum allowable time to rebuild (T_{MAX}) under the current National Standard Guidelines. T_{MAX} is defined as the minimum estimated time to rebuild with no allowable fishing-related mortality (T_{MIN}) plus one mean generation time. The soundness in defining T_{MAX} this way is that one mean generation, or the number of years predicted for a spawning female to replace herself in the population, is a relative biological index of stock productivity. Therefore, the range of allowable rebuilding periods is bounded by the biological limit of T_{MIN} or $T_{F=0}$[19], where all

[19] T_{MIN} and $T_{F=0}$ are both predicted rebuilding periods in the absence of fishing-related mortality to the stock.

stock mortality is natural mortality and a scientifically-derived upper limit linked to stock productivity. Stocks exhibiting low productivity will necessarily have longer predicted rebuilding periods due to longer mean generation times. The probability of rebuilding by T_{MAX} (P_{MAX}) is therefore one of the criteria used to evaluate risk of alternative harvest levels for depleted species, since it is a metric that relates management risk (i.e., risk of not meeting the rebuilding target by T_{MAX}) to a stock's relative productivity.

However, given the guidance from the Ninth Circuit District Court not to follow a formulaic approach for deciding a stock's rebuilding plan, another criterion for evaluating alternative rebuilding plans is to use the extended duration of the predicted rebuilding period relative to $T_{F=0}$. This criterion may be more responsive to the court order to rebuild as quickly as possible (i.e., $T_{F=0}$) while considering the needs of fishing communities. The needs of fishing communities are considered by allowing some harvest of a depleted species as unavoidable bycatch while targeting healthy stocks. Any allowable harvest of a depleted species predicts a longer rebuilding period than $T_{F=0}$. How much longer rebuilding is extended from $T_{F=0}$ is therefore a sensible evaluation criterion.

4.3 Discussion of Direct and Indirect Impacts

This section evaluates and discusses direct and indirect impacts of OY alternatives and action alternatives (management measures) on affected species. A retrospective analysis of past management actions and resulting impacts is critical in this exercise to understand potential future impacts. To that end, final total catch estimates by fishing sector are provided for 2004 West Coast groundfish fisheries (Table 4-6) and "near-final" 2005 total catch estimates (Table 4-7). The reason 2005 catches are not considered final is that the full year of WCGOP observation data is not yet available and analyzed to reconcile at-sea discards; a process which has been completed for 2004 fisheries. In lieu of these data, projected impacts from the various sector bycatch models employed by the GMT to track discards relative to known landings is used. It is anticipated that final 2005 catch estimates will be available by the end of 2006, which is too late to be incorporated in the final EIS.

Impacts of OY alternatives are also compared between action alternatives and with the No Action Alternative and evaluated using the criteria described in section 4.2.

These terms are distinguished by when the F=0 strategy is considered. T_{MIN} is the predicted time to rebuild if all fishing-related mortality is eliminated from the onset of rebuilding (usually the year after the stock is declared overfished) and $T_{F=0}$ is the predicted duration of rebuilding if all fishing-related mortality to the stock is eliminated starting at the onset of the next available management cycle. $T_{F=0}$ is typically longer than T_{MIN} since some fishing-related mortality is typically allowed under a Council's rebuilding plan to avoid disastrous short term economic impacts from eliminating harvest. However, unless the stock has just been declared overfished, $T_{F=0}$ is the shortest possible time to rebuild the stock given our current understanding of the stock's productivity.

Table 4-5. Estimated total mortality (mt) of major West Coast groundfish species from commercial, tribal, and recreational fishing during 2003.

	LANDINGS AND MORTALITY			TARGETS	
Species	Estimated Total Catch	**PRELIMINARY** Estimated Commercial Fishery Discard Mortality b/	Actual Landings c/	Total Catch ABC	Total Catch OY
Lingcod	1,355.6	70.7	1,284.9	841	651
Pacific Cod	1,323.1	73.5	1,249.6	3,200	3,200
Pacific Whiting d/	142,913.8	1,422.7	141,491.1	188,000	148,200
Sablefish (north)	6,386.6	1,126.1	5,260.5	8,209	6,500
Sablefish (south)	204.0		204.0	441	294
Dover sole	8,342.2	956.6	7,385.7	8,510	7,440
English sole	1,241.4	339.0	902.4	3,100	
Petrale sole	2,160.6	144.4	2,016.2	2,762	
Arrowtooth flounder	3,243.5	904.8	2,338.7	5,800	
Other flatfish	2,093.5	490.7	1,602.8	7,700	
Pacific Ocean Perch	160.1	21.9	138.2	689	377
Shortbelly	9.3	2.3	7.0	13,900	13,900
Widow	57.9	16.1	41.8	3,871	832
Canary	48.5	14.2	34.3	272	44
Chilipepper	49.5	15.4	34.1	2,700	2,000
Bocaccio	29.1	8.5	20.6	198	20
Splitnose	118.8	9.3	109.5	615	461
Yellowtail	504.5	22.1	482.4	3,146	3,146
Shortspine Thornyheads e/	1,220.2	387.8	832.4	1,004	955
Longspine Thds. North e/	1,834.8	323.9	1,510.9	2,461	2,461
Longspine Thds. South	0.0			390	195
Cowcod, Monterey	0.4	0.2	0.1	19	2
Cowcod, Conception	0.0		0.0	5	2
Yelloweye	8.1	1.5	6.6	52	22
Darkblotched	139.9	51.8	88.1	205	172
Black Rockfish (north)				615	
Black Rockfish (south)				500	
Black Rockfish Total	1,150.1		1,150.1	1,115	

a/ Preliminary estimates of total catch mortality based on species discard assumptions used when the OYs were set. These assumptions are currently being revised using data from the West Coast Groundfish Observer Program.
b/ Preliminary estimated discard mortality in the commercial fishery. Preliminary trawl discard calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer data to 2002 trawl logbook data, by area and depth strata. Discard totals estimated for tows recorded in logbooks is expanded using state-specific ratios of fish ticket landings to retained logbook catch. Because tows conducted under Exempted Fishing Permits could not currently be completely removed from logbooks and fish tickets, applying fleetwide discard rates to these tows may overstate discard for some shelf species.
In an effort to minimize this problem, rockfish discard from target tonnage caught within the RCA off Oregon was estimated using bycatch rates from that EFP. Since the Washington EFP included full retention of shelf rockfish, no at-sea discard of these species was estimated for tows occurring within the RCA off Washington, or on tows that exceeded the 2-month allowance of arrowtooth flounder outside the EFP. This column also includes at-sea discards of rebuilding species. Preliminary fixed-gear discard in the directed sablefish fisheries is calculated by applying discard mortality rates from combined 2001-03 West Coast Groundfish Observer data to northern sablefish landings data. No logbooks are available for fixed-gear vessels. Because of limited geographic coverage of available data, fixed-gear discard amounts for species off central California are not well estimated at this time.
c/ Includes shoreside commercial and tribal landings from PacFIN, observed total catch including estimated discards in the at-sea whiting fishery, and RecFIN recreational catch plus observed discard mortality (A+B1).
d/ Discards of whiting are estimated from observer data and counted towards the OY inseason.
e/ Includes "unspecified thornyheads" allocated based on ratios estimated from California landings and At Sea north/south ABCs.

Table 4-6. Estimated total mortality (mt) of major West Coast groundfish species from commercial, tribal, and recreational fishing during 2004.

	2004 metric tons											Management reference points	
	Shore-side commercial fisheries				At-sea landings and discard	Shore-side WA tribal	State estimates of total recreational fishing mortality			Remaining GMT scorecard values [b]	Estimated total fishing mortality	Total catch OY	ABC
	Total landed catch	Estimated trawl discard	Estimated non-trawl discard [a]	Estimated total mortality			WA	OR	CA				
Target species													
Sablefish [c]		642	446										
mortality	5,079	321	89	5,489	29	712	0	5			6,235	7,510	8,185
Shortspine [d]	582	174		756	5	6	0	0			767	983	1,030
Longspine [c]	658	137		795	0		0	0			795	2,443	2,461
Dover	6,777	355		7,132	0	81	0	0			7,213	7,440	8,510
Petrale	1,961	76		2,037	0	82	0	0			2,119	2,762	2,762
English	956	193		1,149	0	80					1,229	na	3,100
Arrowtooth	2,328	3,255		5,583	3	82					5,668	na	5,800
Other Flatfish	1,371	497		1,868	2	19					1,889	na	7,700
Slope rockfish	1,073	634		1,707	24	23					1,754	na	na
Yellowtail rockfish [e]	576	80		655	48	352	24	12			1,091	4,320	4,320
Chilipepper [f]	43	102		145	2		0	0	6		153	2,000	2,700
Pacific hake	96,365	2,666		99,031	120,736	6,848					226,615	250,000	514,441
Rebuilding species (as of 2004)													
Lingcod		161.9											
mortality	178.8	80.9	4.5	264.2	1.4	25.0	64.2	107.2	130.0	27.1	619.1	735.0	1,385
Canary	15.9	8.5	3.5	27.9	5.2	3.0	1.7	3.9	9.0	7.3	58.0	47.3	256
Widow	72.9	4.8	0.1	77.8	21.1	21.0	0.0	0.7	15.0	40.6	176.2	284.0	3,460
Yelloweye	1.7	0.4	3.7	5.7	0.0	1.0	3.7	2.4	0.6	2.3	15.7	22.0	53
Bocaccio [f]	12.1	8.7	0.0	20.8	0.0		0.0	0.0	71.0	13.3	105.1	250.0	400
Cowcod [f]	0.0	0.8	0.0	0.9	0.0		0.0	0.0	1.0	0.5	2.4	4.8	24
POP [e]	120.6	23.4	0.0	144.1	1.0	3.0	0.0			7.6	155.7	444.0	980
Darkblotched	191.7	37.1	0.5	229.3	7.4		0.0			4.9	241.6	240.0	240

a/ Non-trawl discard includes estimates for the fixed gear nearshore and sablefish fisheries. Sablefish fishery estimates are based on observations of the primary limited entry, fixed gear season. Since few observations were made in this fishery south of Ft. Bragg, CA, discard estimates for southern species, such as bocaccio and cowcod, should not be viewed as complete.

b/ The Pacific Council's Groundfish Management Team produces a bycatch scorecard with the purpose to account for all sources of expected mortality for species that are managed under rebuilding plans. Remaining values are estimates of total mortality in EFPs and research catches.

c/ Area north of 36° N. Lat.

d/ Area north of 34°27' N. Lat.

e/ Area north of 40°10' N. Lat.

f/ Area south of 40°10' N. Lat.

Table 4-7. Estimated total mortality (mt) of major West Coast groundfish species from commercial, tribal, and recreational fishing during 2005.

Species	Landings	Discard Estimate	Tribal	At-Sea	Recreational	Remaining GMT Scorecard Values	Estimated total fishing mortality	Total catch OY	ABC
Arrowtooth Flounder	2,082	2,854	161	1			5,098		5,800
Dover sole	6,767	707	145				7,619	7,476	8,522
English Sole	856	279	66				1,201	3,100	3,100
Petrale	2,714	155	30				2,899	2,762	2,762
Remaining Flatfish	1,172	306	48	3	37		1,566	4,090	6,781
Shortspine (V&C&E&M)	486	194	11	7			698	999	1,055
Longspine (V&C&E&M)	588	95					683	2,461	2,461
Sablefish Coastwide							6,713		8,368
Sablefish N CP	5,351	485	700	15			6,551	7,486	
Sablefish Conception	144	18					162	275	
Longspine (CP)	60	10					70	195	390
Shortspine (CP)	151	68					219		
Pacific Cod	729		124				853	1,600	3,200
Chilipepper (MT&CP)	36				4		40	2,000	2,700
Yellowtail (V&C&E)	208		581	73	30		892	3,896	3,896
Spiny Dogfish	463		291	70			824		
Slope rockfish Nor	160	45	29	51			285	1,160	
Slope rockfish So	166	18					184	639	
Splitnose RF (MT&CP)	87						87	461	615
Black Rockfish Nor 46 16					271		271	540	540
Black Rockfish So 46 16	173				514		687	753	753
CA Scorpionfish So	5						5		
Cabezon	60						60		
Cabezon S 42	31				48		79	69	103
Cabezon N 42	29				25		54		
Kelp Greenling	22						22		
Kelp Greenling Nor 42	21				6		27		
Kelp Greenling So 42	1				5		6		
Lingcod	173	123	31	2		6	821		2,522
Lingcod N 42	110	78	31	2	204		426	1,801	
Lingcod S 42	63	45			282		390	612	
Canary rockfish	8	5	5	1	12	9	40	47	270
Darkblotched RCKFSH	87	46		11		4	148	269	269
POP (V&C&E)	58	11	4	2		4	79	447	966
Bocaccio	8	52			44	2	106	307	566
Widow Rockfish	81	1	30	79	4	1	196	285	3,218
Yelloweye (V&C&E&M)	1		1		12	7	22	26	54
Cowcod						2			
Cowcod CP								2	5
Cowcod N CP								2	19
Pacific Whiting	96,859	41	35,349	127,421			259,670		269,545

4.3.1 Depleted Groundfish Species

4.3.1.1 Impacts of Optimum Yield Alternatives

Each OY alternative analyzed for depleted groundfish is evaluated using the criteria discussed above in section 4.2. In summation, these evaluation criteria are relative catch monitoring uncertainty, relative assessment uncertainty, the estimated rebuilding probability, and the extended duration of rebuilding. The tradeoff of available harvest under alternative OYs for depleted species and predicted rebuilding times for these species (i.e., the extended duration of rebuilding) is also described in section 2.1.1.1 and depicted in Table 2-3 and Figure 2-2.

This section also describes the types of strategies that should be considered in a groundfish species' rebuilding plan. As OYs decrease across the range of alternatives, more precautionary management measures and risk-averse strategies need to be employed to reduce total fishing-related mortality to prescribed levels.

<u>General Rebuilding Strategies</u>

Harvest Limits (Harvest Guidelines or Quotas)

The Council sets OYs for each depleted stock (among other managed species). Although resulting OYs are considered harvest guidelines, the Council has treated them as hard limits on total fishing mortality for overfished species. For example, they have closed fisheries late in the year if a depleted species' OY is projected to be exceeded. In some cases, OYs for co-occurring healthy groundfish stocks are reduced to limit the incidental mortality of one or more depleted groundfish species.

Permits, Licenses, and Endorsements

Participation in the Washington, Oregon, and California commercial groundfish fishery was partially limited beginning in 1994 when the federal vessel license limitation program was implemented (Amendment 6). Subsequently, Amendment 9 further limited participation in the fixed-gear sablefish fishery by establishing a sablefish endorsement. There is currently no federal permit requirement for other commercial participants (fishers or processors) or recreational participants (private recreational or charter). A buyback of vessels in the limited entry trawl fishery, and associated permits, was completed in 2003. This reduced participation in this sector by roughly one-third.

Trip Landing and Frequency Limits

Cumulative trip limits have been a key fixture of groundfish management for many years. Currently, these limits set for stocks, stock complexes, and species groups dictate the total amount of fish that may be landed during a one- or two-month period. Separate limits are established for the limited entry trawl, limited entry fixed gear, and open access sectors. Landing limits on target species may be adjusted in order to limit coincident catch of depleted species. A limited entry trawl trip limit of 100 pounds per month was established in 2004 for large footrope gear, which may only be used seaward of the Rockfish Conservation Area (RCA).

Seasons

Specification of different seasonal fishing opportunities by region is a management tool increasingly used to limit fishing mortality in West Coast recreational groundfish fisheries. Seasons can be adjusted inseason and often vary by the depths open to fishing to fine tune the balance between fishing opportunities and conservation of depleted species.

Area Closures

Beginning in 2002, RCAs came into use as a way of decreasing bycatch of depleted species. The sector-specific RCAs encompass the depth ranges where bycatch of depleted species is most likely to occur, based on information retrieved from log books, the at-sea observer program, catch records, and trawl survey data; and fishing by designated groundfish fishery sectors is prohibited within its boundaries. The boundaries vary by season and fishery sector, and may be modified in response to new information about the geographic and seasonal distribution of bycatch. Additionally, there are discrete RCAs designed to protect certain species such as cowcod and yelloweye rockfish (two Cowcod Conservation Areas exist south of 34°27' N latitude and one Yelloweye RCA exists in waters off northern Washington). These "species-specific" RCAs also provide a measure of protection for other co-occurring depleted groundfish species.

Gear Restrictions in Trawl Fisheries

Definitions of legal gear types and restrictions on mesh size in trawl gear have been part of the FMP since its inception. A cod end 4.5 inch minimum mesh size has been specified for groundfish trawl gear for many years to reduce the bycatch mortality of juvenile groundfish species and fish that are too small to be marketable. Since 2000, restrictions have been put on the use of trawl nets equipped with large footropes. By using large footropes with heavy roller gear, bottom trawlers can access rocky habitat on the continental shelf. In areas shoreward of the RCA large footrope gear is prohibited, preventing trawlers from accessing rocky habitat in these shallower depths. In areas seaward of the RCA, either small or large footrope gear may be used, although large footrope gear is the preferred gear type in these depths since small footropes tend to dig into the softer sediments of the slope and abyssal plain. In addition, cumulative trip limits have been structured in recent years to encourage vessels to fish exclusively in deep water where some overfished species are less likely to be encountered. Trawl vessels were allowed to use all these legal gear configurations during any given cumulative limit period. However, in 2004 trawl vessels which used the small footrope configuration were restricted to lower cumulative trip limits for target species in comparison to vessels using large footrope configurations. These measures encouraged fishing exclusively in deeper water to take advantage of the higher limits afforded this gear type. In 2005 and 2006, trawl vessels were not restricted with respect to gear-specific cumulative landing limits in any one period, but they were restricted to the area they could fish, either shoreward or seaward of the RCA, in any one period. Large or small footrope trawls were allowed seaward of the RCA, while only small footrope trawls were allowed shoreward of the RCA south of 40°10' N latitude and selective flatfish trawls allowed shoreward of the RCA north of 40°10' N latitude (selective flatfish trawls were also allowed to be used south of 40°10' N latitude, but were not mandated shoreward of the RCA as they were in the north). The selective flatfish trawl net is configured with a cut back headrope, low rise, and a small footrope, a design shown to substantially reduce catches of some rockfish species while more efficiently catching target flatfish species. This is because most rockfish species rise to escape an approaching trawl net, while flatfish species tend to dive. The rockfish escape due to the low rise and cut back headrope. While this gear has been tested and mandated shoreward of the RCA since 2005 in waters north of 40°10' N latitude, it has not been fully tested in waters south of 40°10' N latitude. Therefore, the behavior and bycatch rates of southern rockfish species, such as bocaccio, when encountering a selective flatfish trawl are unknown at this time. However, this gear may also be effective at reducing bycatch of southern rockfish species in the bottom trawl fishery and should be explored further.

Bycatch reduction devices (BRDs), also known as fish excluders, are mandated for the exempt trawl fishery targeting pink shrimp. Pink shrimp trawls historically had a high bycatch of rockfish. ODFW researched various BRD configurations to determine those devices that significantly reduced rockfish bycatch without an overall reduction in pink shrimp catch efficiency. Now specific hard grate BRDs and other accepted configurations are mandated for West Coast pink shrimp trawls and resulting rockfish bycatch has been reduced dramatically.

Gear Restrictions in Fixed Gear Fisheries

Limited entry and open access fixed gear fisheries on the West Coast use hook and line gears, longlines (both vertically and horizontally deployed on the bottom or suspended off the bottom), and pots/traps to target groundfish. Rockfish bycatch has been shown through WCGOP observations to be much lower in pots and traps targeting groundfish than line gears. While a substantial portion of the fixed gear fleets use pots and traps, a significant amount of line gear is used to target nearshore groundfish species and sablefish. Five of the seven rockfish species currently managed under rebuilding plans are shelf species vulnerable to capture using line gears. The two depleted slope species, darkblotched rockfish and POP, are rarely caught using fixed gears. Therefore, measures that would reduce the use of line gears in West Coast shelf areas, where these depleted rockfish species occur, should be considered when developing long term rebuilding strategies. Alternatively, how line gears are fished should be explored more thoroughly since some line gear configurations and fishing strategies may also reduce the bycatch of depleted groundfish species.

Size and Bag Limits

Minimum size limits are specified for many depleted groundfish species to protect recruiting and premature fish from targeted harvest.

Bag limits are a daily limit of species allowed to be retained by anglers. These measures are used for recreational fisheries to limit mortality of depleted groundfish species. In some cases, no retention is allowed for depleted groundfish species as a means to eliminate any potential targeting that might otherwise occur.

Fishery Monitoring and Bycatch Estimation

All commercial groundfish landings are monitored through a fish ticket system requiring reporting by buyers and processors. Bycatch has become a crucial component of total fishing mortality for depleted species. In the last five years, harvest limits or OYs have evolved from an allowed landing limit to a total mortality limit where at-sea dead discards are also counted against the OY. NMFS implemented the West Coast Groundfish Observer Program (WCGOP) in August 2001, and these data were first used to estimate total fishing mortality beginning in mid-2003. The limited entry trawl sector was the first commercial sector to be managed using WCGOP data to estimate discards. In 2004 bycatch modeling was expanded to the primary sablefish fishery prosecuted by limited entry fixed gear vessels as WCGOP data became available for that sector. In 2005 WCGOP data was used to model bycatch of groundfish species in nearshore commercial fisheries in California and Oregon. As more observer data from different fishery sectors become available, further model extensions will be developed to more accurately estimate bycatch of depleted species in these sectors.

Recreational fishery monitoring and bycatch estimation is a state responsibility and each West Coast state employs a different system. Washington and Oregon employ a random, stratified census of anglers to estimate catch and effort with relative precision. In California, where the coastline is much longer, recreational participation much greater, and the larger number of ports, recreational monitoring and catch estimation was done through a federal census known as Marine Recreational Fisheries Statistical Survey (MRFSS). The MRFSS survey, designed to look only at national trends of marine angler participation, is not precise enough to manage the low harvest guidelines used in recreational fishery management to help rebuild depleted stocks. Therefore, in recent years, efforts have been made to improve recreational fishery sampling in California. For instance, in 2001 the Pacific States Marine Fisheries Commission (PSMFC), with support from NMFS, began a new survey to estimate party/charter boat (commercial passenger fishing vessel [CPFV]) fishing effort in California. This survey differed from the traditional MRFSS telephone survey of anglers to determine CPFV trips by two-month period. The survey sampled 10% of the active CPFV fleet each week to determine the number of trips taken and the anglers carried on each trip. This 10% sample was then expanded to make estimates of total angler trips for Southern California and Northern California. However, the requisite precision for managing the low OYs of overfished species like canary rockfish and bocaccio was still lacking. Fishery scientists from the CDFG and the PSMFC designed a new program for sampling California's recreational fisheries, incorporating both the comprehensive coverage of the MRFSS program and the high quality sampling of CDFG's Ocean Salmon Project. The goal of this new program, the California Recreational Fisheries Survey (CRFS), was to produce in a timely manner marine recreational, fishery-based data needed to sustainably manage California's marine recreational fishery resources. The CRFS program, implemented in January 2004, increased the timeliness and accuracy of recreational fisheries data to more effectively monitor catches inseason, estimate take of species of concern, develop harvest guidelines, produce higher quality fishery-dependent indices for stock assessments, and provide other information critical to management decisions.

Bocaccio (in Waters off California South of 40°10' N Latitude)

Specific Bocaccio Rebuilding Strategies

Bocaccio OYs, compliant with the adopted rebuilding plan, have been specified for managing this stock. In most years (with the exception of a slight overage in 2003 when the OY was ≤20 mt, or about 6.5% of the 2006 OY), bocaccio total mortality has been well below the specified OY (Tables 4-5, 4-6 and 4-7). The Council and NMFS have also adopted the practice of reducing the chilipepper rockfish OY from the ABC, despite the healthy abundance of this stock, as a precautionary measure to reduce the incidental mortality of co-occurring bocaccio. Reducing the chilipepper rockfish OY for the purpose of reducing bocaccio mortality may be less necessary given the advent of managing fisheries using depth-based RCAs.

Commercial bocaccio fishery impacts are managed using a combination of area closures (discussed below) and variable cumulative landing or trip limits. A limited entry trawl trip limit of 100 pounds of bocaccio per month was established in 2004 for large footrope gear to accommodate unavoidable bycatch, which may only be used seaward of the RCA. Limited entry fixed gear and open access limits vary by two-month period and north and south of Point Conception within a range of being closed in some periods to 300 pounds per two-month period. Under the No Action Alternative, trip limits for co-occurring southern shelf rockfish species, including chilipepper rockfish, have been adjusted to limit the incidental harvest of bocaccio.

Recreational bocaccio impacts are managed using a combination of area closures (discussed below), minimum size and daily bag limits (discussed below), and seasons. California manages its recreational fisheries according to five sub-areas (referred to as Rockfish/Lingcod Management Areas) defined by latitudinal boundaries. Different closed seasons have been applied, and modified inseason, primarily to limit canary rockfish catches, the most constraining of the overfished species; but these actions also serve to limit recreational catches of bocaccio.

Area closures or RCAs are one of the more effective rebuilding strategies for reducing bocaccio mortalities. South of 40º10' N latitude, the seaward boundary of the RCA or the limited entry trawl sector is 150 fm in 2006, and the shoreward boundary varies between 75 fm and 100 fm, depending on period. Around offshore islands south of 34°27' N latitude the inner boundary extends to the shoreline. The seaward boundary is the same for limited entry fixed gear and open access sectors; the shoreward boundary either 20 fm, 30 fm, or 60 fm, depending on area and period. California has implemented, and modified inseason, closed areas in their recreational management, restricting fisheries to areas shoreward of boundaries at 20 fm, 30 fm, or 60 fm, depending on sub-area and month. Additionally, the existing Cowcod Conservation Areas south of 34°27' N latitude, where sport and commercial bottom fishing is prohibited, provide significant protection for bocaccio. Any additional RCAs south of 40°10' N latitude in the 15-180 fm zone will provide some additional protection of bocaccio. The greatest density of bocaccio occurs south of 34°27' N latitude in the 54-82 fm zone; therefore, any new RCAs in the Southern California Bight in these depths should provide the most conservation benefit. However, bocaccio are less sedentary than rockfish species such as cowcod and yelloweye. Smaller, discrete RCAs may therefore provide incrementally less conservation benefit for bocaccio relative to more sedentary species.

Minimum size and daily bag limits are used to restrict targeting of juvenile bocaccio and total take of bocaccio, respectively. A 10-inch minimum size limit is applicable to bocaccio in waters off California. Under the No Action Alternative, California has implemented a 10-fish bag limit for the rockfish-cabezon-greenling stock complex. Within the 10-fish bag limit there are bocaccio sub-limits of two fish north of 40º10' N latitude and one fish south of 40º10' N latitude.

Evaluation of Optimum Yield Alternatives

Bocaccio rebuilding schedules across the analyzed OY alternatives range from 0-11 years relative to the shortest predicted time to rebuild the stock of 2021 (i.e., 2021-2032) (Table 4-8). Rebuilding probabilities range from 50% for the highest OY alternative of 424 mt, which is the legal upper limit of possible OYs that can be considered, to 95.8% for the zero-harvest alternative. A significant amount of the total mortality of bocaccio now occurs in the California recreational fishery, the sector with the largest bocaccio take in recent years (Tables 4-5, 4-6 and 4-7), which leads to a high catch monitoring uncertainty. While California recreational catch time series are important fishery-dependent indices in the bocaccio stock assessment, the MacCall {2006} assessment is considered relatively certain given generally good data quality and consistency.

The range of preferred OYs specified by the Council in April 2006 of 40-218 mt compares to the status quo 2006 OY of 309 mt. Rebuilding is extended by less than a year from the shortest possible time ($T_{F=0}$) under the harvest rate used to determine the 40 mt alternative to 5 years under the preferred High OY alternative of 218 mt, which is 3 years shorter than under the status quo harvest rate. The range of rebuilding probabilities (P_{MAX}, or the probability of successful rebuilding in the maximum allowable time under National Standard 1 guidelines) for these preferred OYs are 77.7% to 94.3%. Last year, the SSC recommended a general rebuilding policy of establishing harvest rates that lead to rebuilding probabilities of about 80%[20]. The preferred OY range for bocaccio approximates this P_{MAX} "target".

[20] This recommendation came under the consideration of rebuilding revision rules the Council and its advisors crafted in 2005. The Ninth Circuit Court of Appeals ruling on the challenge to the darkblotched rebuilding plan may have obviated the need for these revision rules by imposing a standard of specifying the shortest possible rebuilding periods while considering the needs of fishing communities. However, as described in section 4.2, P_{MAX} is still a reasonable criterion for evaluating future risks of overharvest given a stock's relative productivity.

Table 4-8. Evaluation of alternative 2007-2008 bocaccio OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)						
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**Pref. Low OY Alt.**	**OY Alt. 2**	**OY Alt. 3 (Pref. High OY)**	**OY Alt. 4**	**OY Alt. 5**
	309	0	**40**	149	**218**	315	424
Catch monitoring uncertainty	High uncertainty due to a significant recreational catch component using MRFSS data (prior to 2004). [a/]						
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.						
Rebuilding Probability (P_{MAX})	68.4%	95.8%	94.3%	84.4%	77.7%	67.8%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	8	0	0.8	3	5	8	11
a/ Catch monitoring uncertainty has improved with the implementation of the California Recreational Fisheries Survey (CRFS) in 2004. However, until CRFS is fully evaluated and catch estimates are provided in a more timely fashion, catch monitoring uncertainty is still regarded as relatively high.							

The recent history of bocaccio assessments is one marked with volatile swings in our understanding of stock status and productivity driven largely by infrequent recruitment events. MacCall {2002} characterized the stock as severely depleted and unlikely to rebuild within T_{MAX} under a zero-harvest strategy. However, evidence of a significant recruitment of the 1999 year class was validated in the bocaccio assessment conducted the following year {MacCall 2003}. The emerging understanding is stock productivity may better be characterized as one driven by rare large recruitments. Minimizing the mortality of these large year classes promises to rebuild the stock fastest. In the current regime of depth-based management, the stock is most vulnerable in the juvenile phase when they occur in shallow waters and are incidentally caught in nearshore commercial and recreational fisheries. However, as bocaccio mature, they migrate to deeper waters where the current RCA restricts those fisheries which are most likely to take adult bocaccio and other co-occurring depleted rockfish. There is some indication that bocaccio recruitment typically occurs from Santa Barbara to Santa Cruz, and is rare south of Ventura, with no evidence of separate southern California recruitment events {MacCall 2003}. Therefore, if this recruitment pattern persists in the future, large recruitment events may be indicated by large incidental catches in central California nearshore fisheries. As recent management experience also indicates, avoiding juvenile bocaccio in these waters during such times is difficult.

Given this recruitment dynamic, what harvest rate provides the best balance of conservation needs without overly restricting California commercial and recreational fisheries? The new bocaccio assessment {MacCall 2006} shows exploitation rates have favored rebuilding since 1998. Those OYs fall within the preferred 2007-2008 OY range of 40-218 mt; however, only in 2003, when fisheries were severely restricted due to the pessimistic 2002 assessment result, was the annual total mortality of bocaccio ≤40 mt. The Preferred Low OY may still be difficult to manage with the same restrictive management measures used in 2003 in the event of another large recruitment. Clearly, a significant negative economic impact would be felt in California fishing communities under the Preferred Low OY harvest rate for a rebuilding "cost" of about four additional years of rebuilding under the Preferred High OY harvest rate. Even under the Preferred High OY of 218 mt, management measures would have to be restrictive, especially for nearshore commercial and recreational fisheries in central California, to stay within that harvest rate during years of large recruitments.

Evaluation of Action Alternatives

All the action alternatives contemplate a liberalization of the Cowcod Conservation Areas in the Southern California Bight. The CCAs currently protect more than just cowcod. An ongoing analysis of larval abundance data suggest that the current western CCA is a region of high abundance of bocaccio (S. Ralston, unpublished data), with the recent density particularly high relative to the long term (historical) distribution of bocaccio. Although the CCA was not implemented to protect bocaccio, the potential to increase catches of other rebuilding species that could result from modifications to CCA boundaries is presumably non-trivial.

Action Alternative 1 is the only action alternative estimated to stay within the Preferred Low OY Alternative for bocaccio. Most of the southern nearshore and shelf groundfish fisheries are constrained by the Preferred bocaccio Low OY, but especially those fisheries south of Pt. Conception. Action Alternatives 2 and 3 stay within the Preferred High OY Alternative for bocaccio.

As recent experience has shown, a strong year class will initially be caught in nearshore fisheries and hard to avoid. Higher OYs or a rebuilding framework that allows one-year overages if the long term harvest rate is not exceeded should be considered for this stock due to its episodic recruitment pattern.

Canary Rockfish

Specific Canary Rockfish Rebuilding Strategies

All of the rebuilding strategies used to reduce mortality of depleted species on the West Coast are used to help rebuild canary rockfish. Management of this stock tends to constrain more West Coast fisheries than any other groundfish stock since canary rockfish are distributed coastwide, are found in a variety of habitats, and are caught by a variety of different fishing gears. Canary rockfish are distributed from nearshore areas as juveniles out to about 150 fm as adults and are found at times suspended off the bottom or in atypical soft-bottom habitats for rockfish.

Management of canary rockfish under the harvest rates specified in the current rebuilding plan has been difficult and OYs have been exceeded in two of the last three years. The canary rockfish OY was exceeded by 4.5 mt in 2003, 11 mt in 2004, but, in 2005, total estimated mortality was less than the OY by about 7 mt. Tailoring the management regime to stay within the low harvest rates specified for canary and other depleted rockfish has been an evolutionary process of adaptive management. Better impact modeling with an increasing sample of depth-based discard rates from the WCGOP, gear restrictions (described below), capacity reduction of the limited entry trawl fleet, educational outreach to anglers to avoid canary and other depleted rockfish, restrictive limits and non-retention regulations, and, most importantly, depth-based RCA management have all contributed to improved performance of the management regime in managing canary rockfish.

Canary rockfish are not allowed to be retained in commercial and recreational hook and line or fixed gear fisheries and a small, incidental landing limit is allowed in the limited entry trawl fishery to account for unavoidable incidental bycatch. However, mandating the use of the selective flatfish trawl shoreward of the RCA north of 40°10' N latitude has helped reduce trawl bycatch. Attempts to test selective flatfish trawls south of 40°10' N latitude through implementation of Exempted Fishing Permits have not been successful due to lack of participation. Nevertheless, while these trawls are legal small footrope gear in the south and are volitionally used, experience with these trawls in the north compels consideration of mandating their use shoreward of the RCA south of 40°10' N latitude. At-sea monitoring of their efficacy in southern fisheries through the WCGOP may eventually validate their use in the south. Midwater trawls also catch canary rockfish. The directed midwater trawl fishery for yellowtail rockfish was discontinued in 2002 due to high bycatch of canary and widow rockfish. The midwater trawl fishery for whiting, which is not currently restricted in the trawl RCA, also catches canary rockfish. Implementation of a canary rockfish bycatch cap, where, if attained, the non-tribal fishery would close inseason even if whiting quotas have not been attained, has successfully reduced canary rockfish mortality. This strategy works for the whiting fishery because of near real-time bycatch reporting and open communication to the rest of the fleet when bycatch of canary occurs in any one area.

Use of broad based RCA configurations has had the most effect in reducing canary rockfish mortality and the concept of depth-based RCA management was largely compelled by this need. Figure 4-2 shows the catch per tow of canary rockfish in the NMFS bottom trawl survey, which can be used as an index of the stock's depth and latitudinal distribution. While there are some instances of canary rockfish occurring south of Pt. Conception at 34°27' N latitude, they are largely distributed north of Conception with the greatest density in northern waters off Washington. They are most often found in depths from 50-100 fm, but as can be seen in Figure 4-2 and from Table 4-1, they can occur in the 27-150 fm depth range. The core depth range of the trawl RCA is 100-150 fm, with both shoreward and seaward extensions of the RCA boundaries depending on seasonal conservation needs (canary rockfish and other depleted species tend to make seasonal shoreward-seaward migrations with more shallow distributions in the summer months). Most of the incidental trawl take of canary rockfish occurs shoreward of the RCA since the seaward boundary is often extended out to 200 fm to reduce mortality of darkblotched and POP. The non-trawl RCA extends out to 100 fm north of Cape Mendocino and 150 fm south. Most of the incidental non-trawl take of canary rockfish occurs seaward of the RCA in the north. More discrete area closures, such as those used to reduce mortality of cowcod and yelloweye rockfish, may also help reduce canary mortality, but will likely prove to be less effective for canary rockfish due to their mobility and apparent lack of site fidelity.

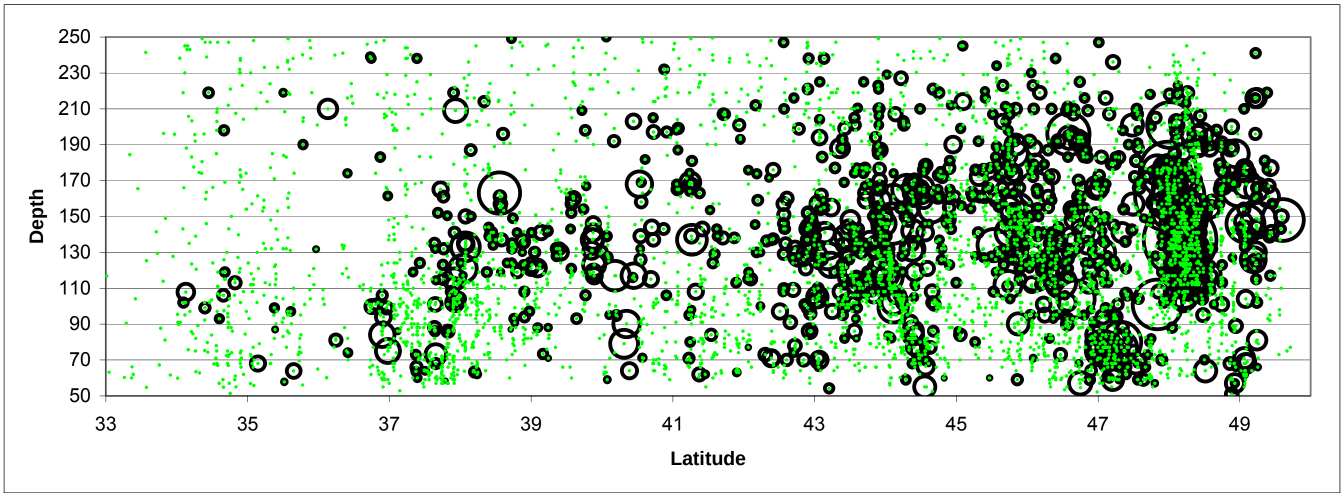


Figure 4-2. Catch per tow of canary rockfish in the bottom trawl survey. Dots are tows with zero catch. Circle size is proportional to the square root of catch per tow. Depth is in meters. Figure from the 2005 canary rockfish assessment (Methot and Stewart 2006)

Evaluation of Optimum Yield Alternatives

Table 4-9 shows the results of the evaluation of alternative canary rockfish OYs analyzed for 2007-2008 using the criteria described in section 4.2.

The canary rockfish OYs considered for 2007-2008 are based on a relatively certain stock assessment, despite the fact that recent recruitments are unknown due to a lack of recent fishery-dependent information (since the fishery has been structured to avoid canary) and the most recent years of the NMFS Northwest Fishery Science Center combined shelf/slope bottom trawl survey were not used. The second, "mop-up" STAR Panel, which reviewed the assessment in September 2005, also recognized the bottom trawl surveys may not provide an adequate index of abundance for shelf rockfish. For canary rockfish, the particular concern is that the level of stock depletion in trawlable habitat may not be reflective of overall population status. However, the historical data inputs to the assessment are more certain than for many of the other West Coast stocks and the 2005 assessment received a particularly high level of scientific scrutiny.

The relative certainty of the assessment result is tempered by a relatively uncertain total catch monitoring component, particularly since there is a significant portion of the total annual catch taken in recreational fisheries. Precautionary management of recreational fisheries to stay within the low canary OYs analyzed in this EIS will still be a predominant theme in rebuilding this stock and managing West Coast fisheries in the coming years. Uncertain total catch estimates will also lead to increasing assessment uncertainty as total removals become less certain and fishery-dependent trends used as assessment indicators of recruitment and biomass are less reliable.

Rebuilding probabilities (P_{MAX}) for alternative canary rockfish OYs are all low ranging from 66% for the zero-harvest alternative to 50% for the highest OY considered. The harvest rates for the Preferred Low and High OYs have a 55% and 58% probability of rebuilding by T_{MAX}, respectively, while the No Action OY predicts about a 55% probability of successful rebuilding by T_{MAX}. Such low rebuilding probabilities infer increased risk in canary stock rebuilding, a condition which recommends a precautionary management approach.

The estimated median time to rebuild the canary rockfish stock under the zero-harvest alternative is 2053. An additional 7 years of rebuilding is predicted under the harvest rate used to determine the Preferred Low OY of 24 mt and 10 years under the Preferred High OY of 44 mt. This compares to slightly more than 11 years under the status quo OY and an additional 18 years under the highest OY of 68 mt. Given that canary rockfish is the most constraining stock in the West Coast groundfish fishery, this tradeoff in canary OY vs. rebuilding duration will be one of the more important considerations for the Council and NMFS.

Table 4-9. Evaluation of alternative 2007-2008 canary rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)					
	No Action OY Alt. (2006 OY)	OY Alt. 1	OY Alt. 2	Pref. Low OY Alt.	OY Alt. 3 (Pref. High OY)	OY Alt. 4
	47	0	24	**32**	**44**	68
Catch monitoring uncertainty	High uncertainty due to a significant recreational catch component.					
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.					
Rebuilding Probability (P_{MAX})	54.8%	66%	60%	58.3%	55.4%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	11.4	0	5	7	10	18

Evaluation of Action Alternatives

Action Alternative 1 is the only action alternative estimated to stay within the Preferred Low OY Alternative for canary rockfish. Most of the current northern fisheries primarily constrained by canary rockfish OYs, such as recreational groundfish fisheries, are predicted to be more constrained by the Preferred Low OY for yelloweye under Action Alternative 1 (Table 2-14). Likewise, the Preferred Low OY for bocaccio tends to constrain southern fisheries historically constrained by canary rockfish more than the Preferred Low OY for canary rockfish. Action Alternatives 2 and 3 stay within the Preferred High OY Alternative for canary rockfish. While yelloweye rockfish OYs will be increasingly more constraining under the Preferred High OY ramp-down strategy, canary rockfish OYs will continue to be the most constraining to fisheries, especially in the four-year yelloweye harvest rate ramp-down transition period under that alternative.

Cowcod

Specific Cowcod Rebuilding Strategies

The prevailing management strategy for rebuilding cowcod is complete avoidance and allowing fisheries with only a “de minimus” fishing-related mortality. Historically, cowcod, due to their large size and superior flesh quality, were targeted in commercial and recreational fisheries. Non-retention regulations have been implemented for all West Coast fisheries to eliminate any possible targeting. Most importantly, all the critical cowcod habitat known through area-specific fishery information and other site-specific survey data have been closed to any type of bottom fishing that might take cowcod. These critical habitats are encompassed in two areas in the Southern California Bight south of Point Conception called the Cowcod Conservation Areas (CCAs, Figure 2-3). Area management is a particularly effective strategy for protecting cowcod given their sedentary life style and site fidelity. Piner et al. {2006} determined these management measures have been effective in keeping total mortality well under the low OYs used to manage this stock since the implementation of the CCAs and no retention regulations in 2001.

Evaluation of Optimum Yield Alternatives

It is particularly difficult to evaluate the cowcod OY alternatives given the great uncertainty in actual total catch and stock status. Both of these factors compel a very precautionary approach in rebuilding this very unproductive stock. OY alternatives 3-5 may be risky given this high uncertainty and the longer rebuilding periods (17-39 years beyond $T_{F=0}$) predicted by those harvest rates. The preferred OY range of 4-8 mt in the Conception and Monterey areas have much shorter predicted rebuilding periods, extending the duration of rebuilding 4-8 years beyond the time predicted under a zero-harvest strategy. The estimated rebuilding probabilities under the preferred Low and High OYs are also reasonably high (P_{MAX}≥80%), which helps mitigate the risk of managing stock rebuilding with such high uncertainty.

Table 4-10. Evaluation of alternative 2007-2008 cowcod OYs relative to the criteria described in section 4.2.

Evaluation Criterion	**OY (mt)**						
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**Pref. Low OY Alt.**	**OY Alt. 2 (Pref. High OY)**	**OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**
	4.2	0	**4**	**8**	14	18	22
Catch monitoring uncertainty	Very high uncertainty due to a paucity of at-sea observations.						
Assessment Uncertainty	Very high uncertainty due to poor data quality.						
Rebuilding Probability (P_{MAX})	90.2%	100%	90.6%	80%	70%	60%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	4.1	0	4	8	17	27	39

Evaluation of Action Alternatives

All the action alternatives contemplate a liberalization of the Cowcod Conservation Areas in the Southern California Bight. The most significant risk of altering the perimeters of the CCA is the possibility that incidental catches of cowcod would increase, either as a result of incidental catches at the boundary of the fathom lines, or from incidental catches resulting from inadvertent incursions of vessels into shallower depth in the boundary lines. Such risks are associated with all of the potential alterations to both the outer and inner perimeters. Although this risk is difficult to evaluate, the steep and complex topography of the continental shelf and slope in these regions, and the corresponding complexity of the perimeter line alternatives that would be developed to exclude fishing from those depths in which cowcod are most abundant, suggests that there is significant potential for such incursions.

It is worth noting that while most cowcod are found within the 40 to 150 fm depth range, commercial catch and resource survey data demonstrate that cowcod can be found as shallow as 20 fm, in low-moderate numbers to 220 fm, and infrequently to at least 270 fm {Butler et al. 1999; Love et al. 2002; unpublished survey data}. Consequently, even with precise adherence by commercial fishermen to the outer perimeter of 175 fm under action alternatives 1 and 2, and similar performance by recreational fishermen to the inner perimeters of either 30 fm (Alt. 1) or 40 fm (Alt 2), bycatch of cowcod would be expected to increase by some amount under any of the alternatives. Although Action Alternative 1 (the four-area alternative) would presumably have less of an impact with respect to the potential for increased cowcod mortality, all of the areas proposed in this alternative are described as areas of moderate to high densities based on CDFG fishing block catch rate data (figures 5 and 6 in Appendix IV of Piner et al. 2006). Additionally, Potato Bank (west of San Nicolas Island), as well as Cortes Bank were both observed to have high densities of adult cowcod in the recent submersible survey {Yoklavich et al., in prep}. Alternatives 2 and 3 could be expected to have increasingly higher impacts on cowcod as they increase the areal extent of cowcod habitat open to fishing significantly to substantially.

Both Potato Bank and the Santa Barbara Island areas, that would be open in all alternatives but the No Action Alternative, were also recently described as areas with high concentrations of newly described species of black corals {Tissot et al. 2006}, for which nearly all of the high concentrations were observed within the current boundaries of the CCA. Independent of the above concerns, it is worth noting that a growing amount of habitat information in the Southern California Bight may be informative with respect to altering the CCA boundaries in the near future. Additional analysis of such data, and associated habitat preferences by cowcod and other species, could more adequately ensure that habitat known to be optimal for cowcod is protected in future CCA revisions.

With respect to monitoring stock abundance and recovery, changing the boundaries of the CCA could undermine the ability to replicate recent resource surveys, such as the submersible survey and the enhanced CalCOFI ichthyoplankton survey. In particular, the submersible survey conducted by Yoklavich et al. (in prep) was used in the last assessment as a single point estimate of abundance of a given year within the CCAs, expanded by a scaling factor developed based on catch rate data in recreational fisheries. Both the STAR Panel and the SSC report on the cowcod assessment stressed the paucity of data available for this stock, highlighted the potential of this survey for monitoring cowcod trends, and emphasized the need for a consistent time series in order for this survey to be relied upon with confidence for detecting trends. Specifically, alterations to the boundaries of the CCA could undermine the assumptions necessary to replicate this survey in order to develop a second data point for monitoring stock trends. In other words, a second survey may not be comparable with the first, if the conditions (exploitation rates) within the survey area had changed.

This is a particularly important factor given that the four fishing areas proposed under Alternative 1 include three of the eight banks upon which the 2002 visual survey was based; Potato Bank, Santa Barbara Island, and Cortes Bank. The cowcod assessment represents one of the most data-poor assessments in the recent assessment cycle, such that only three free parameters (R_0, steepness and the catchability coefficient for the visual survey) were actually estimated in the model. Aside from the submersible survey, there are no fishery independent data to inform the assessment (in the most recent assessment review, the STAR Panel recommended removal of the CalCOFI time series that was used in the first assessment), nor are there length-frequency data or other information to estimate recruitment variability. As catch rate data were effectively the most important time series index in the assessment, the submersible survey offers one of very few potentially available data series for monitoring stock trends and recovery. Given the paucity of data available for the cowcod assessment, it will be important to attempt to maintain consistency in management measures (to the extent practicable) until an effective monitoring system is in place.

The magnitude of fishing that could take place under any of the action alternatives, and the extent to which such fishing could increase mortality on cowcod and other rebuilding species, will be particularly difficult to assess without adequate observer coverage on vessels that fish within these closed areas. The current cowcod OY could potentially be entirely harvested in a small number of “disaster sets”, and the extent to which any observer data that was collected would over, or under, estimate cowcod mortality is difficult to detect with the limited observer coverage for this region. Consideration of the challenges associated with adequately monitoring total mortality that could result from any modification to the CCA should be a high priority in selecting a preferred alternative, including some evaluation of the amount of observer coverage that might be expected from the WCGOP under any of the alternative scenarios.

Enforcement issues are presumably challenging under the proposed alternatives to the status quo. The current boundaries have been shown to be easily understandable to fishermen and enforcement personnel, thus meeting their objectives in rebuilding the cowcod (and other) resources. The practicability of enforcement using VMS data, particularly with respect to the legal issues surrounding the ability of states to use proprietary VMS data for enforcement purposes, is another complicating factor that has yet to be resolved for the purposes of implementing the Alternatives. This, and additional challenges to enforcement that could be associated with any perimeter modification, should also be carefully considered prior to any adoption of proposed alternatives to status quo.

Darkblotched Rockfish

Specific Darkblotched Rockfish Rebuilding Strategies

Darkblotched rockfish are caught almost exclusively by groundfish trawl gear and predominantly bottom trawls operating on the outer continental shelf and slope north of 38° N latitude between 100 and 200 fm (Figure 4-3). The two most significant strategies used to control darkblotched fishing mortality are limited entry trawl trip limits for the southern and northern minor slope rockfish complexes, the complexes in which darkblotched are managed, and implementation of the trawl RCA, where modifications to the seaward boundary tend to have the greatest effect on darkblotched take. As an example, in 2004 the Council and NMFS decided to provide more opportunity to harvest healthy Dover sole, thornyheads, sablefish (DTS), and flatfish stocks in the limited entry trawl fishery while staying within the darkblotched OY of 240 mt. In May the trawl RCA was decreased by moving the seaward boundary inshore to 150 fm and increasing DTS and flatfish limits. By September it was apparent the darkblotched OY would be exceeded without a significant adjustment to the trawl fishery. The trawl RCA was then extended from the shoreline (primarily to address over-attainment of canary rockfish) out to 250 fm north of 40°10' N latitude, from the shoreline out to 200 fm between 38° N latitude and 40°10' N latitude, and trip limits were severely reduced. The very important winter petrale sole fishery was foregone among other important fishing opportunities. By the end of the year, the darkblotched OY was exceeded, but only by 1.6 mt (Table 4-6). This indicates the sensitivity of RCA boundary adjustments when managing fisheries to stay within low darkblotched rockfish rebuilding OYs.

Area management beyond adjustment of the seaward boundary of the trawl RCA may be an effective rebuilding strategy for darkblotched rockfish. Figure 4-3 indicates an apparent clustered distribution of darkblotched as evidenced by area-specific catch per tow data in past NMFS trawl surveys. While the clustered distribution of darkblotched in Figure 4-3 is informative, the apparent distribution is also affected by the survey sampling regime in that not all of the combined survey data is shown, 0-catch hauls are not shown, and that the depths and latitudes sampled by all surveys have been irregular over time. In 2004, observers noted two very large catches (8,000-15,000 lbs), which were partially discarded {Rogers 2006}. They were both from an area that also had large survey catches at approximately 40.5° N latitude in 200 fm (Figure 4-3). These large catches tended to contain larger than average fish {Rogers 2006}. Closure of those areas might provide additional darkblotched conservation benefits.

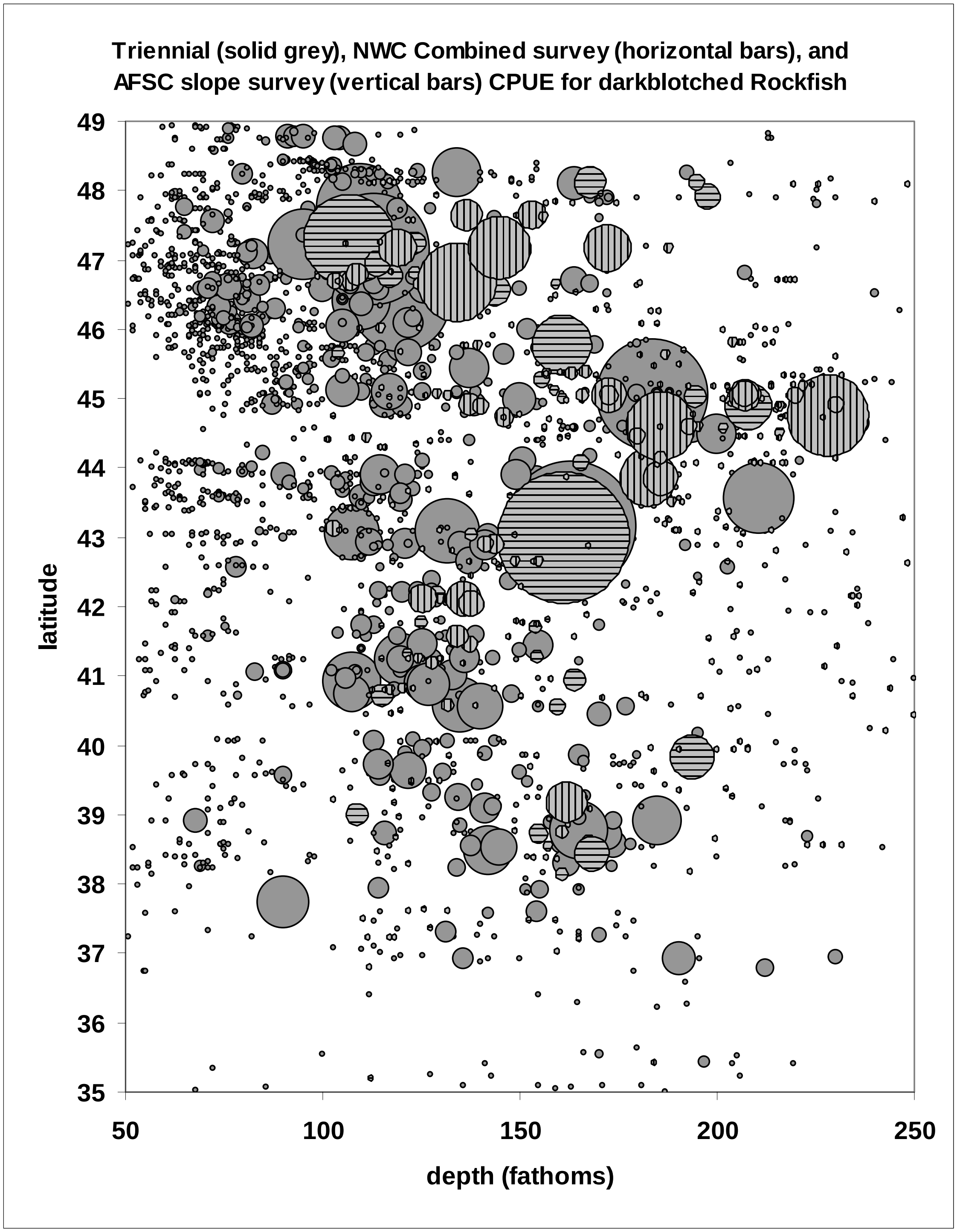


Figure 4-3. Index of West Coast distribution of darkblotched rockfish by latitude and depth as determined by catch per tow in NMFS trawl surveys. Size of circle is proportional to darkblotched rockfish density at that location. Data from NOAA Northwest Fisheries Science Center's West Coast Groundfish Survey Database and the NOAA Alaska Fisheries Science Center Triennial Shelf and Slope Survey Database.

Evaluation of Optimum Yield Alternatives

Table 4-11 shows the results of the evaluation of alternative darkblotched rockfish OYs analyzed for

2007-2008 using the criteria described in section 4.2.

The much more optimistic 2005 darkblotched assessment is largely based on validation of strong recent recruitments. These recruitments are relatively certain in the assessment input data despite the inconsistency in assigned ages of darkblotched in the sample data, which leads to the ranking of "moderate" assessment uncertainty.

The catch monitoring of darkblotched is relatively certain since the limited entry bottom trawl fishery takes the vast majority of the total annual take while targeting DTS and flatfish species on the slope. Estimation of at-sea discards of darkblotched and other species in the trawl fishery has become increasingly certain with the increased observations from the WCGOP. The overfishing of darkblotched that occurred in 2004 (Table 4-6) may be prevented in the near future since model projections using WCGOP discard rates are better informed and landings plus discard are now tracked in near-real time in PacFIN's Quota Monitoring Species (QSM) reports[21].

All the darkblotched OY alternatives have exceptionally high rebuilding probabilities at or approaching 100%. The range of most depleted species' OYs analyzed in this EIS have an OY alternative at or close to 50% P_{MAX}. Conversely, the highest darkblotched OY alternative has a very high 97% P_{MAX} since it is capped at the ABC, which is determined using a proxy harvest rate. Therefore, all the harvest rates used to determine alternative darkblotched OYs and rebuilding strategies are considered risk-averse using this evaluation criterion.

The rebuilding periods associated with alternative darkblotched OYs are relatively short for a depleted rockfish. Under the zero-harvest alternative, rebuilding is predicted to occur by 2009.5. The Preferred Low OY Alternative of 130 mt extends this rebuilding duration by less than half a year, while the Preferred High OY Alternative of 229 mt extends rebuilding by slightly more than half a year. This compares to rebuilding duration beyond $T_{F=0}$ under the status quo OY of slightly more than half a year (equivalent to that under the Preferred High OY) and 2.5 years of extended rebuilding under the largest OY considered of 472 mt. The tradeoff in rebuilding duration vs. allowable darkblotched harvest shows that a greater harvest rate than has been sustained in recent years can still successfully rebuild the darkblotched rockfish stock with a small incremental increase in the rebuilding period. While these strong, incoming year-classes to the spawning stock biomass favor expeditious rebuilding, fishery interceptions of darkblotched will likely increase making it more difficult to manage the low status quo OYs using status quo management measures.

21 The GMT uses the PacFIN QSM report to track OY attainment inseason for recommending adjustments to fisheries to stay within OYs. In 2005, the GMT started incorporating projections of discard mortality in association with landings in the QSM report to better track total fishing-related mortality of managed species.

Table 4-11. Evaluation of alternative 2007-2008 darkblotched rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	**OY (mt)**					
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**OY Alt. 2 (Pref. Low OY)**	**OY Alt. 3 (Pref. High OY)**	**OY Alt. 4**	**OY Alt. 5**
	200	0	**130**	**229**	330	472
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.					
Assessment Uncertainty	Moderate uncertainty due to data inconsistency (ageing uncertainty).					
Rebuilding Probability (P_{MAX})	100%	100%	100%	100%	100%	97.2%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	0.6	0	0.4	0.7	1	2.5

Evaluation of Action Alternatives

All of the action alternatives analyzed for 2007-2008 contemplate more conservative management of slope trawl fisheries than status quo. Action Alternative 1 is the only alternative estimated to stay within the Preferred Low OY Alternative for darkblotched, but as can be seen in Table 2-14, the Preferred Low OY Alternative for POP is even more constraining to slope trawl fisheries. Action Alternative 2 and 3 stay within the Preferred High OY for darkblotched, but the Preferred High OY for POP is again more constraining (Tables 2-19 and 2-21).

The more effective and accurate catch monitoring and tracking mechanisms used to manage slope trawl fisheries should significantly improve inseason management adjustments to future trawl fisheries and thus avoid the overfishing problem encountered in 2004. Inseason adjustments are anticipated to be fundamental in managing trawl fisheries to stay within whatever darkblotched OY is chosen for 2007-2008 as increased encounter rates of darkblotched are expected with the strong recruitments observed in the latest assessment.

Pacific Ocean Perch

Specific Pacific Ocean Perch Rebuilding Strategies

Pacific ocean perch have been under rebuilding since 1981. The population off the northern U.S. West Coast (Columbia and U.S./Vanc. areas) is at the southern extreme of the stock and rebuilding potential may be more effected by mortalities in waters north of the U.S./Canada border. Nevertheless, the trawl RCA configuration used to reduce darkblotched mortalities, which has been the more constraining stock in slope trawl fisheries since implementation of rebuilding measures in 2001, has significantly reduced POP mortalities. Continued use of RCA management coupled with precautionary slope rockfish trawl trip limits may be the most effective combination of strategies available to the Council and NMFS for rebuilding this stock. Given the stock's overall distribution in the Northeast Pacific, a collaborative U.S./Canada research and management plan needs to be explored.

Evaluation of Optimum Yield Alternatives

Table 4-12 shows the results of the evaluation of alternative POP OYs analyzed for 2007-2008 using the criteria described in section 4.2.

Both catch monitoring uncertainty and assessment uncertainty are relatively low for this species given the fact that the vast majority of total fishing-related mortality occurs in limited entry bottom trawl efforts.

Rebuilding probabilities range from 50% to 100% across the range of analyzed POP OYs and are especially high (>95%) for the Preferred Low and High OY Alternatives. This compares to a 73% P_{MAX} under the status quo OY of 447 mt, which is almost 4.5 times higher than the Preferred High OY Alternative.

The shortest possible time to rebuild the West Coast POP stock under a zero-harvest strategy is 2014.6. The Preferred Low OY Alternative extends rebuilding by less than half a year longer and the Preferred High OY Alternative extends rebuilding by approximately one year. This compares to about 8 years of extended rebuilding under the status quo OY and over 30 years under the harvest rate used to determine the highest OY considered (OY Alternative 5).

Table 4-12. Evaluation of alternative 2007-2008 Pacific ocean perch OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)							
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**Pref. Low OY Alt.**	**OY Alt. 2**	**Pref. High OY Alt.**	**OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**
	447	0	**44**	87	**100**	405	514	749
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.							
Assessment Uncertainty	Relatively certain due to generally good data quality and consistency.							
Rebuilding Probability (P_{MAX})	73%	100%	99.5%	96.7%	95.8%	80%	70%	50%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	7.9	0	0.4	0.4	1	6	10	33

Evaluation of Action Alternatives

In recent years, the effective harvest rate of POP in trawl slope fisheries has been much less than that specified in the POP rebuilding plan because darkblotched OYs were more constraining. The Preferred Low and High OY alternatives are much lower than the No Action OY and, depending on the harvest rate decided for the darkblotched rockfish rebuilding plan, could become the constraining stock in future trawl slope fisheries in waters off Oregon and Washington.

Only Action Alternative 1 constrains fisheries enough to stay within the Preferred Low OY Alternative for POP, while Action Alternatives 2 and 3 stay within the Preferred High OY.

Widow Rockfish

Specific Widow Rockfish Rebuilding Strategies

The Council chose to eliminate the non-tribal midwater trawl fishery targeting yellowtail and widow rockfish in 2003 to reduce widow rockfish exploitation {PFMC 2003}. The WDFW sponsored a midwater trawl EFP in 2002 and 2003 to attempt to shape a fishery that effectively targeted yellowtail while avoiding widow. However, this EFP was discontinued prematurely in 2003 because about 28% of the catch was widow rockfish (B. Culver, personal communication). There is still a tribal midwater trawl fishery that targets yellowtail rockfish, but incidentally catches some widow rockfish. The 2005-2006 limits for this fishery were a fleet-wide (the Makah Tribe was the only tribe prosecuting a midwater trawl fishery) cumulative landing limit of 180,000 lbs of yellowtail rockfish/two months. Widow rockfish landings were limited to 10% of the weight of yellowtail rockfish landed in any two-month period. These midwater landing limits were subject to inseason adjustments to minimize the take of canary and widow rockfish. Management of the tribal midwater trawl fishery is designed to minimize impacts to canary and widow rockfish through avoidance. Observer data is analyzed daily and vessels are told which areas to avoid when these species are encountered.

The Council also chose to manage widow rockfish bycatch beginning in 2004 by precautionary management of midwater trawl fisheries that target Pacific whiting. This has traditionally been the fishery with the greatest incidental bycatch of widow rockfish, excluding the directed yellowtail/widow midwater trawl fishery which was discontinued in 2002. While the shoreside whiting sector has exhibited a clear recent trend of reduced widow rockfish bycatch, widow bycatch in the at-sea sectors has been more random. All whiting trawl sectors showed a significant decrease in widow rockfish bycatch in 2003 (Figure 4-4). The at-sea vessels receive daily reports of bycatch by vessels in their fishery, where there is 100% observer coverage, and actively avoid areas where there has been a high bycatch of salmonids, widow, and yellowtail rockfish. Another contributing factor to the lower widow bycatch in 2003 was a significantly increased abundance of whiting in 2003 which resulted in shorter tows to fill trawls. In years when whiting are less abundant and more dispersed, widow bycatch can become an increasing concern as vessels extend their search for whiting schools and have longer tow times (D. Myer, personal communication). Shorter tows on aggregated whiting schools would sensibly reduce widow bycatch since whiting tows are made in daylight hours when widow rockfish are dispersed. There was also a greater abundance of whiting off the north Washington coast in 2003 that kept at-sea whiting vessels more northerly and away from Oregon and southern Washington coastal areas where widow are more abundantly distributed.

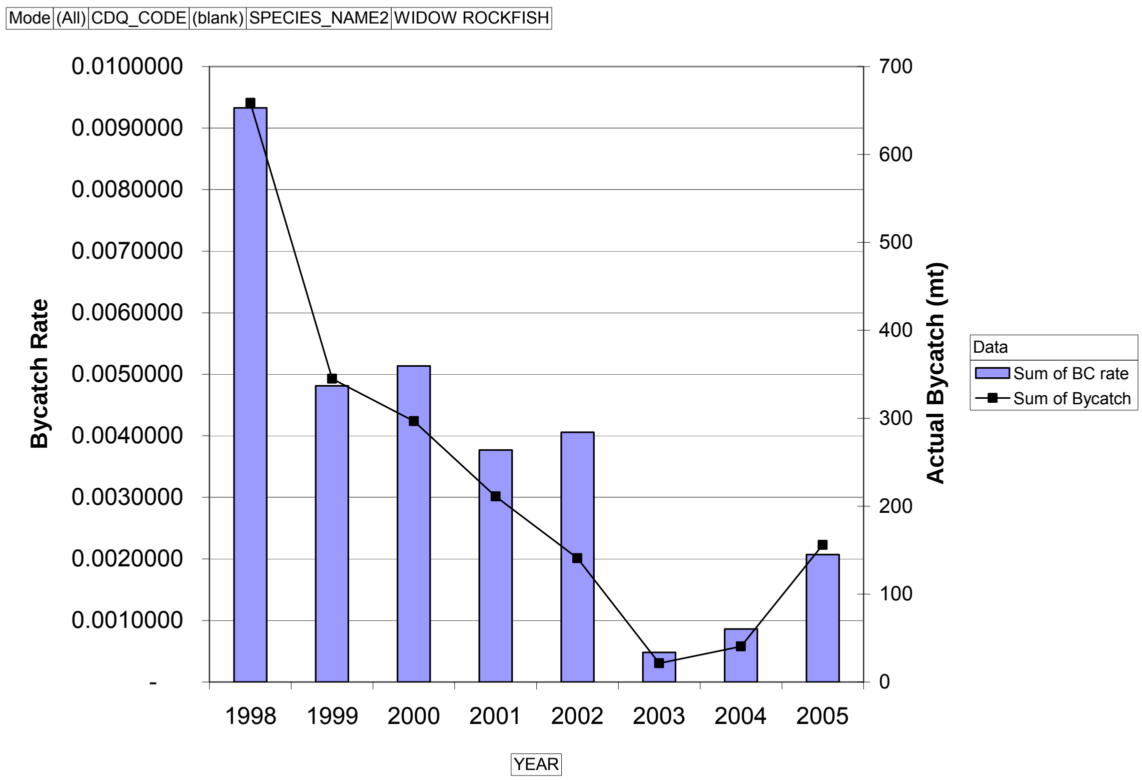


Figure 4-4. Annual Widow Rockfish Bycatch Rate and Bycatch in the Non-tribal Sectors of Whiting-directed Midwater Trawl Fisheries.

In recent years, the GMT has recommended consideration of the following management strategies to reduce widow rockfish bycatch in whiting fisheries: 1) a precautionary reduction in whiting OYs, 2) hard widow rockfish bycatch caps by sector in the whiting fisheries or a hard cap imposed for all sectors combined, 3) establishing avoidance strategies by timely reporting of widow bycatch rates by area that would compel the fleet to move away from such areas, and 4) prohibiting the whiting fishery in areas of highest widow rockfish densities.

As stated above, the Council has elected to specify hard widow rockfish bycatch caps on the non-tribal sectors of the whiting fishery. It is noted that the majority of widow rockfish bycatch in whiting fisheries occurs infrequently in "disaster tows" that may be due to inexperience on the part of the skipper or an unpredictable encounter. Since each sector has a different season, it is conceivable that one sector could pre-empt fishing opportunities for another by experiencing a few “disaster tows.” Originally, in 2004, the Council recommended hard bycatch caps for both canary and widow rockfish for all whiting sectors combined, including the tribal sector. However, in 2005, these hard caps were adjusted and implemented only for the non-tribal shoreside and at-sea sectors combined. The specified widow rockfish bycatch cap was originally 200 mt, but adjusted inseason to 212 mt. The 2006 cap was set at 200 mt. Managing the whiting fishery with hard bycatch caps has forced active avoidance of widow and, as Figure 4-4 indicates, has successfully reduced widow bycatch to desired levels. The strategy works due to timely reporting to the rest of the fleet of areas where higher widow bycatch occurred. The at-sea fleets (catcher-processors and motherships) have 100% observer coverage. They also have an independent contractor collect at-sea bycatch information daily, who reports back to the fleet when the bycatch of any particular species of concern rises in any one area. The fleet then moves to areas where whiting can be more cleanly targeted.

The shoreside sector has a similar mechanism for minimizing bycatch. This sector operates under an EFP that mandates full retention of species and landing of all the catch. This allows full sampling of the total catch upon landing. The buyer reports back to the fleet if a landing from a particular area shows a higher than desired bycatch. However, catch can be discarded at sea if landing the bag poses an immediate threat to vessel safety. Since the shoreside fleet does not operate with 100% observer coverage, there may be an incentive to discard at sea if a larger than expected bycatch of widow rockfish occurs. The NMFS started placing cameras on all shoreside whiting vessels in 2004 as an experimental effort to determine if discarding occurs on otherwise unobserved trips. In 2004, a total of 1,003 trips and 1,030 sets were observed using deck-mounted cameras. Non-retention occurred in 19% of sets observed. Most of this non-retention was from fish bled from the codend of the trawl, although some discard occurred from fish dumped off the deck. Most of the observed discards occurred during the last haul of the trip and most discards were < 45 kg total estimated weight. [2005 results?] Starting in 2006, camera monitoring is mandated in the Shoreside Whiting EFP.

An innovative government-industry collaboration coordinated by the NMFS Northwest Fishery Science Center, the Pacific Whiting Conservation Cooperative, and the Fisherman's Marketing Association was launched in 2004 to explore the development of an abundance index methodology specifically for widow rockfish. The goal of this effort was an exploration of non-extractive techniques using acoustics and cameras. This feature was viewed as particularly important owing to the depleted status of this species. As proof of concept, pilot survey work off Newport, Oregon in March 2005 confirmed the ability to reliably locate, observe, and quantitatively measure widow rockfish schools with conventional single frequency fishery acoustics techniques in combination with underwater video cameras. The sites sampled off central Oregon, a subset of those identified by fishermen in the ad hoc working group, were found to contain widow rockfish aggregations, which supports the strategy to rely on use of local fisherman's knowledge of fishing grounds as a sampling framework. The acoustics data collected with the scientific echosounder installed on a fishing vessel was of good scientific quality, which allowed a detailed examination of patterns of variability in widow rockfish populations (see report entitled "Update on the Development of a Commercial Vessel-Based Stock Assessment Survey Methodology for U.S. West Coast Widow Rockfish: A Report to the ad hoc Working Group" by P. Ressler, G. Fleischer and V. Wespestad). The success of the pilot work indicated that the acoustic surveys could be a successful monitoring tool but should be expanded to include other study sites along the West Coast in order to provide coastwide monitoring of the species. Such research is critical for determining a much needed, reliable index of widow rockfish abundance as the established NMFS bottom trawl is ineffective for this semi-pelagic species and fishery-dependent indices no longer reliably track abundance since the fisheries avoid widow rockfish. A reliable, fishery-independent survey will be a very important contribution to our understanding of stock status and trends, which should lead to better area management strategies for widow rockfish, as well as holding potential for other depleted rockfish.

Evaluation of Optimum Yield Alternatives

Table 4-13 shows the results of the evaluation of alternative widow rockfish OYs analyzed for 2007-2008 using the criteria described in section 4.2.

Catch monitoring of widow rockfish is relatively certain given that the stock is mostly caught as bycatch in trawl fisheries and is predominantly caught in whiting-directed trawl fisheries where at-sea observation rates are highest on the West Coast.

Conversely, the assessment result is relatively uncertain due to the lack of a reliable widow abundance index. In past assessments, widow bycatch in whiting-directed trawl fisheries has been used to understand biomass trends. However, with the need for whiting fleets to reduce their widow bycatch, that index is no longer recommended for assessing stock trends. The promise of an effective and useable hydroacoustic survey index is still many years off. The survey would have to be proven through continued research before managers and scientists invest in these resources. And, if that happens, multiple years of survey data would be needed before temporal biomass trends can be discerned and used in assessment. Therefore, assessment uncertainty is relatively uncertain, which should be considered when the Council determines a final rebuilding plan. (In fact, this uncertainty was taken into account when the Council decided not to pursue "delisting" widow rockfish as an overfished species given the assessment result that the stock never did reach a threshold of depletion below $B_{25\%}$. The Council understood there was very little new data informing this new assessment and acknowledged the uncertainty was too great to depart from the rebuilding plan.)

Most of the widow rockfish OY alternatives analyzed in this EIS have high rebuilding probabilities (P_{MAX} at or above 80%). Only OY Alternative 5 (1,369 mt) has a P_{MAX} less than the SSC "target" of ≥80%. The Preferred Low and High OY alternatives have very high rebuilding probabilities of 98% and 95%, respectively. In terms of the P_{MAX} criterion, the harvest rates used to determine these OYs are risk-averse rebuilding specifications.

The strong, year classes recruiting to the widow rockfish spawning stock are evidenced by the short rebuilding times predicted across a large range of OYs (Table 2-3 and Figure 2-2). The shortest possible time to rebuild the stock under a zero-harvest strategy is 2013. The Preferred Low OY harvest rate is predicted to extend rebuilding about a year longer than this and the Preferred High OY harvest rate extends rebuilding by yet another year. This compares to slightly less than two years of extended rebuilding under the status quo OY, which is intermediate to the Preferred Low and High OY Alternatives.

Table 4-13. Evaluation of alternative 2007-2008 widow rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	**OY (mt)**							
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**Pref. Low OY Alt.**	**OY Alt. 2**	**Pref. High OY Alt.**	**OY Alt. 3**	**OY Alt. 4**	**OY Alt. 5**
	289	0	**120**	329	**368**	456	917	1,369
Catch monitoring uncertainty	Relatively certain due to a predominant trawl catch component.							
Assessment Uncertainty	Relatively uncertain due to lack of a reliable abundance index.							
Rebuilding Probability (P_{MAX})	96.2%	100%	98.4%	95.7%	95.2%	94%	80%	60%
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	1.8	0	1	2	2	3	7	14

Evaluation of Action Alternatives

All the action alternatives assume the same basic strategy of reducing widow rockfish mortalities by specifying caps in non-tribal fisheries targeting whiting. While other sectors may be able to reduce their impacts with widow avoidance strategies, the impacts in directed midwater trawl fisheries for whiting promise to most substantially reduce widow mortalities. The large recruitments of widow rockfish predicted in the new stock assessment may be a significant management challenge for the whiting fishery, depending on the widow harvest rate and OY selected for the widow rockfish rebuilding plan and the bycatch caps specified in future whiting fisheries.

Only Action Alternative 1 is conservative enough to stay within the Preferred Low OY Alternative for widow, while all the action alternatives stay within the Council's Preferred High OY Alternative. Managing for a 120 mt OY (Preferred Low OY) will most certainly constrain future whiting fisheries significantly given the OY is less than the status quo bycatch caps specified for 2005 and 2006 whiting fisheries. It will prove difficult, if not impossible for the whiting sectors to fully attain future whiting allocations if the cap is as low as it would have to be under the Preferred Low OY Alternative.

Yelloweye Rockfish

Specific Yelloweye Rockfish Rebuilding Strategies

Of all the new groundfish stock assessments conducted in 2005-2006, the yelloweye rockfish assessment shows the most pessimistic change from status quo. A significant adjustment of status quo management is needed to rebuild this stock given the much lower OYs projected from the new rebuilding analysis. While status quo management of yelloweye has relied on a similar avoidance strategy as is used to minimize cowcod mortalities (i.e., no retention regulations and specific area closures), there are still some fisheries, such as recreational and commercial fisheries in the north targeting Pacific halibut, that will need to be further constrained to stay within the lower OYs analyzed in this EIS. A more comprehensive area management strategy, where more of the critical habitats where yelloweye reside are closed to fishing efforts known to take yelloweye, may be most effective at further reducing mortalities and should be seriously considered. Other mechanisms, such as season and depth restrictions, should also be considered to reduce yelloweye mortality.

Yelloweye rockfish have a similar life history pattern as cowcod. They are sedentary and exhibit more side fidelity than most rockfish species. Prohibiting fishing activities that are prone to catch yelloweye in areas they frequently occur is likely to be one of the best strategies for minimizing total mortality. Broad, depth-based RCAs are effective at reducing fishing-related mortality, and, in fact, the seaward boundary of the non-trawl RCA north of 40º10' N latitude is configured to reduce mortality of yelloweye by fixed gears. However, specific yelloweye RCAs, like the existing one off the north Washington coast (Figure 2-3), are likely to be most effective at reducing incidental mortality in hook and line fisheries. Figure 4-5 depicts the relative density of yelloweye by depth and latitude as indicated by catch per tow in West Coast trawl surveys. Assuming the composite trawl survey CPUEs accurately represent yelloweye distribution, yelloweye RCAs north of 39º N latitude in depths out to 100-125 fm should provide the most protection for yelloweye against incidental exploitation.

Gear restrictions have been shown to be effective at reducing yelloweye mortality as well. Mandating small footrope and selective flatfish trawls shoreward of the trawl RCA has significantly reduced yelloweye mortality.

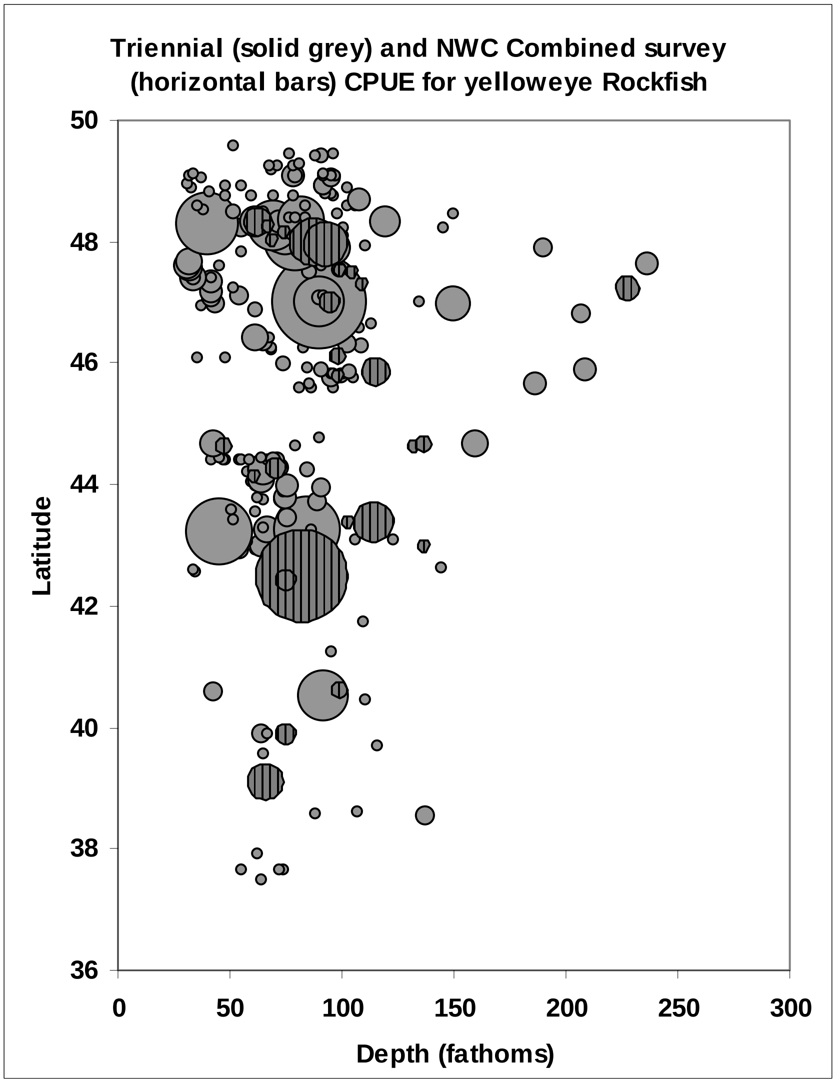


Figure 4-5. Index of West Coast distribution of yelloweye rockfish by latitude and depth as determined by catch per tow in NMFS trawl surveys. Size of circle is proportional to yelloweye rockfish density at that location. Data from NOAA Northwest Fisheries Science Center's West Coast Groundfish Survey Database and the NOAA Alaska Fisheries Science Center Triennial Shelf and Slope Survey Database.

Evaluation of Optimum Yield Alternatives

Table 4-14 shows the results of the evaluation of alternative yelloweye rockfish OYs analyzed for 2007-2008 using the criteria described in section 4.2.

There is considerable uncertainty in catch monitoring systems for tracking total catches of yelloweye. The sector currently taking the most yelloweye through unavoidable bycatch is the recreational sector targeting groundfish and Pacific halibut and, as pointed out in section 4.2, recreational catch monitoring is relatively uncertain. However, catch monitoring uncertainty is even more extreme for yelloweye since it is a rare species in the catch for any sector and, of the commercial sectors currently taking yelloweye, the fixed gear fisheries take the most and WCGOP at-sea observations are more sparse for fixed gear fisheries (particularly in the south). Precautionary management is called for with such high catch monitoring uncertainty.

The yelloweye rockfish assessment is also one of the more uncertain assessments done for West Coast groundfish since the fishery-dependent catch data are sparse and not well known and there is a significant lack of fishery-independent data in the assessment since survey bottom trawls do not catch yelloweye particularly well. The assessment is therefore tuned to highly uncertain recreational CPUE indices that may be more affected by past management restrictions and catch monitoring uncertainty than trends in stock biomass. This high uncertainty calls for precautionary management of stock rebuilding since the true state of nature may be more pessimistic (or optimistic) than the current assessment indicates.

Rebuilding probabilities are relatively high for the yelloweye OY alternatives considered for 2007-2008, ranging from 100% under the zero-harvest alternative to 80% for the Preferred Low OY and High OY alternatives. These preferred OYs are within the "target" range of 80% recommended by the SSC. This compares to about a 46% P_{MAX} under the status quo OY, which is under the lower legal limit of 50%. Of the two preferred OYs adopted for detailed analysis by the Council in April 2006, the Preferred High OY "ramp-down" strategy is slightly more risky in that it assumes a four-year transition from the current management regime before adopting a constant harvest rate strategy equal to that under the Preferred Low OY Alternative. Assuming the 2007-2010 OYs are not exceeded under the ramp-down strategy, there is no effective difference in P_{MAX} between the Preferred Low and High OY alternatives.

The relatively low productivity of the West Coast yelloweye stock predicts very long rebuilding periods. The shortest possible time to rebuild the stock under a zero-harvest strategy would be 2048 (Table 2-3). The harvest rate used to determine the 12 mt alternative (OY Alternative 2) is estimated to extend rebuilding an additional 30 years beyond that, while the Preferred Low OY and High OY alternatives are estimated to extend rebuilding an additional 35 and 35.5 years, respectively. This compares to over 71 additional years of rebuilding under the status quo harvest rate currently specified for rebuilding the yelloweye stock. The effect of a four-year transition from the status quo harvest rate to the low harvest rate under the Preferred Low OY Alternative is about a half a year of additional rebuilding under the ramp-down strategy.

Table 4-14. Evaluation of alternative 2007-2008 yelloweye rockfish OYs relative to the criteria described in section 4.2.

Evaluation Criterion	OY (mt)				
	No Action OY Alt. (2006 OY)	**OY Alt. 1**	**OY Alt. 2**	**Pref. Low OY Alt.**	**Pref. High OY Alt.**
	27	0	12	**12.6**	**Ramp down** [a]
Catch monitoring uncertainty	Very high uncertainty due to a paucity of at-sea observations and a significant recreational catch component.				
Assessment Uncertainty	Very high uncertainty due to poor data quality.				
Rebuilding Probability (P_{MAX})	45.7%	100%	81%	80%	80% [b]
Rebuilding Duration Beyond $T_{F=0}$ (yrs.)	71.5	0	30	35	35.5
a/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.					
b/ P_{MAX} (and the harvest rate beginning in 2011) are the same as for the Preferred Low OY Alternative.					

Evaluation of Action Alternatives

The very conservative management measures described under Action Alternative 1 in Chapter 2 are the only suite of management measures that are predicted to stay within the Council's Preferred Low OY Alternative. Management measures under Action Alternatives 2 and 3 stay within the OYs under the Council's Preferred High OY alternative, or the ramp-down strategy. Every action alternative specifies the implementation of a number of new Yelloweye RCAs to reduce mortality, but there is no quantifiable impact savings determined in this EIS from those proposed area closures. While it is unknown how overall total yelloweye mortality may be reduced by these YRCAs, some reduced mortality is anticipated and should be realized in 2007-2008 if these area closures are implemented. Reduced mortality should first be evidenced in decreased encounters in recreational fisheries in Washington and Oregon and reduced bycatch observed in the WCGOP, particularly in the limited entry and open access fixed gear sectors.

An important aspect of the YRCAs proposed for 2007-2008 is that comprehensive fishery and survey data are unavailable for understanding the distribution of critical yelloweye habitats. The proposed YRCAs under the 2007-2008 action alternatives emerged in consultation with fishermen in potentially affected commercial and recreational sectors as areas where they have traditionally encountered yelloweye. Many of these proposed RCAs are within the habitats of greatest yelloweye density as inferred from trawl survey CPUEs (Figure 4-5). A larger, less fragmented area management strategy may ultimately be more effective for rebuilding the yelloweye stock since it would likely reduce mortalities by protecting the most critical habitats yelloweye reside and will be easier to enforce. However, the YRCAs currently proposed is a good first start in transitioning to a significantly lower harvest rate. If closing only these proposed areas is deemed insufficient for getting to lower OYs, then conservative inseason depth and season restrictions will be needed to stay within these rebuilding limits. All the action alternatives contemplate stringent yelloweye harvest guidelines, which would force conservative inseason adjustments to those sectors experiencing difficulty avoiding yelloweye impacts.

4.3.1.2 Impacts of Rebuilding Alternatives

As explained in 2.1.1, rebuilding alternatives (Table 2-2b) were developed by arranging the depleted species' OYs in various combinations in order to understand how the rebuilding plans for different species interact to cumulatively constrain fishing opportunities. The description of each rebuilding alternative's impacts, below, is predominantly qualitative, as these suites of OYs were not crafted so that the Council would choose its depleted species OYs wholly from one of the alternatives. Rather, the function of the discussion below is to highlight, through its panoramic view across all depleted species, how each species might differentially constrain fishing opportunities by sector (or gear type) and region along the West Coast. Another point made in this section is that one depleted species (such as canary rockfish, which has a coastwide distribution and affects nearly all fishing sectors) can constrain opportunity in many sectors even if high OYs are selected for other co-occurring depleted species.

Rebuilding Alternative 1

Under Rebuilding Alternative 1, canary rockfish is a constraining species limiting both the commercial and recreational sectors. For limited entry bottom trawl, the canary rockfish OY limits the catch of target species, such as petrale and Dover sole in the summer months, as well as English sole, arrowtooth flounder, and Other Flatfish on the continental shelf. Applying depth restrictions is the primary management tool to reduce the impact of limited entry fixed gear and open access fisheries on depleted species. The canary rockfish OY, as well as the yelloweye rockfish OY, could cause these fisheries to be restricted to depths greater than 100 fm north of 40°10' N latitude (rather than 100 fm under status quo).

Although the canary rockfish OY is the primary constraint on the recreational sector, yelloweye rockfish is also a constraining species for the sector, especially for recreational fisheries in Washington and Oregon. For California recreational fisheries, the bocaccio OY also substantially constrains opportunity. Affected recreational fisheries include those targeting black rockfish, blue rockfish, cabezon, lingcod, Pacific halibut, and greenling. In general, management measures that would be needed under this alternative, in order to restrict encounters with canary rockfish, would be similar to those under Action Alternative 1 (see section 4.3.1.1). However, a greater impact to yelloweye rockfish would be possible under this alternative than is expected under Action Alternative 1. This could allow for less restrictive management measures in some sectors, particularly Washington and Oregon recreational fisheries.

Canary rockfish also constrains the whiting fishery. Given recent bycatch rates, canary rockfish could constrain the whiting fishery to a catch at a level approximately two thirds of the 2006 Pacific whiting OY. However, the whiting fleets have avoided many of the impacts to depleted or protected species through innovative bycatch reduction techniques, such as near real-time reporting of bycatch and voluntary fleet mobilization when bycatch in a particular area is high. In the past two years, setting bycatch caps for the non-tribal whiting sectors has effectively minimized the bycatch of depleted groundfish species.

The bottom trawl fisheries on the continental slope become more liberalized under this alternative. As a result, the available OYs for two of the main deepwater target species, petrale sole and sablefish, are able to be nearly or fully achieved. Given this more liberal scenario, it is the precautionary species, petrale sole and sablefish, which become constraining to fishing opportunities for other target species in limited entry bottom trawl, such as Dover sole and thornyheads. Nevertheless, the catch of Dover sole and thornyheads can still occur at levels equal to or higher than status quo levels. Species that have a high degree of co-occurrence with darkblotched rockfish (particularly those within the slope rockfish complex) are caught at levels that are substantially less than the available OY for those species. As has been the case in recent years, the POP OY is greater than that which can be accessed by these fisheries, given the constraints of other co-occurring species.

This alternative contains a widow rockfish OY that is higher than status quo; the OY is also greater than the estimated impact from the whiting fishery, the primary sector to catch widow incidentally. However, a midwater yellowtail rockfish and widow rockfish fishery cannot be re-introduced because the fishery's anticipated bycatch of canary rockfish could not be accommodated under this alternative's canary rockfish OY.

Rebuilding Alternative 2

Under Rebuilding Alternative 2, the northern fisheries that operate along the continental shelf and in nearshore areas are particularly constrained. The canary rockfish OY is set at a status quo level within this alternative, and therefore the impacts to fisheries would be expected to be similar to that seen under the current management. The yelloweye rockfish OY in this alternative, however, is set to a level lower than status quo (and also lower than under Rebuilding Alternative 1). Since yelloweye rockfish is caught almost exclusively by line gear, this alternative is particularly constraining to northern fixed gear and recreational fisheries. In order to lower the incidental catch of yelloweye within the recreational sector, the groundfish and, in northern waters, the Pacific halibut fishery would have to be restricted to shallower depths (potentially ≤20 fm) and/or new yelloweye RCAs would need to be established in areas of high yelloweye density where recreational bottom fishing would be prohibited. One possibility to reduce the limited entry and open access fixed gear impact on yelloweye rockfish would be to extend the non-trawl RCA seaward north of 40°10' N latitude, although establishing yelloweye RCAs could also help reduce impacts. The management measures to restrict impacts to canary rockfish and yelloweye rockfish under this alternative would be similar to those under Action Alternative 3.

Pacific ocean perch and darkblotched rockfish constrain bottom trawl fisheries along the northern slope areas to the same extent as under status quo management. Management measures under this alternative would also be similar to those described in Action Alternative 3. Similar to the case in Rebuilding Alternative 1, petrale sole and sablefish somewhat constrain the catch of other target species in the deepwater bottom trawl fisheries, such as Dover sole and thornyheads. However, the catch of these species is equal to or higher than the amount of catch occurring under status quo management. The whiting fishery operates as it would under status quo because its constraining bycatch species (canary rockfish, widow rockfish, and darkblotched rockfish) do not change under this alternative.

This alternative liberalizes the southern fisheries by increasing the bocaccio and cowcod OYs relative to status quo, although nearshore and shelf fisheries would still be constrained by canary rockfish, given the species coastwide distribution. Recreational fishermen in California, for example, might be able to fish at deeper depths or have a slightly longer season under this alternative. However, given the bocaccio OY is only slightly higher than the status quo impacts of about 150 mt of bocaccio in all fisheries combined, these increased opportunities might be slight. This is especially true if a strong year class of bocaccio is caught at a higher rate in nearshore fisheries, creating a temporary increase in bocaccio mortality until the fish mature and move to deeper depths.

Rebuilding Alternative 3

Rebuilding Alternative 3 is the most liberal of all of the rebuilding alternatives. Only the yelloweye rockfish OY specified within this alternative is less than that under status quo (although not much different than the realized status quo total mortality); some of the other OYs are substantially greater than those under status quo. This alternative provides for greater opportunities than those found in any of the Action Alternatives or in status quo management measures.

This alternative has the highest attainment of target species for most of the commercial sectors compared to other rebuilding alternatives, although current constraints on fisheries posed by low yelloweye OYs would not be lifted. Nevertheless, multiple target species OYs are not fully attained because the catch of precautionary zone target species caught in the commercial fishery (i.e., petrale sole and sablefish) limits the catch of healthy target species such as Dover sole and thornyheads. Commercial fixed gear fisheries, on the other hand, would continue to be constrained by the yelloweye rockfish OY.

Additional target opportunities could be accommodated under this alternative. For example, a midwater trawl fishery for yellowtail rockfish is possible, given that the widow rockfish OY is large enough to allow targeting and the canary rockfish OY is high enough to account for impacts that would be expected due to the co-occurrence of the three species. Only under this alternative would catch of widow rockfish approach the level of the OY; under the other alternatives (as well as under status quo) the widow rockfish OY is too low to allow this yellowtail rockfish target opportunity. The highest widow rockfish OY that could be considered in the new rebuilding analysis (1,369 mt) cannot be considered since canary rockfish would constrain midwater trawl opportunities, even under the higher amount under this rebuilding alternative (68 mt) before that amount of widow rockfish would be incidentally caught. The whiting fishery, which currently takes the greatest amount of widow rockfish, would be much less constrained by widow rockfish or canary rockfish under this alternative.

Northern recreational fisheries are still constrained by the yelloweye rockfish OY under this alternative. However, the effect on the fisheries may be mitigated by the higher canary rockfish OY in that management measures could direct fisheries away from areas with high yelloweye bycatch even if this increased the bycatch of canary rockfish. Depending on the management measures used to constrain the fisheries, fisheries directed toward black rockfish, Pacific halibut, lingcod, and greenling, amongst others, could be affected. Since yelloweye is rarely caught south of Cape Mendocino ($40^{o}10'$ N latitude), southern recreational fisheries are more liberalized under this alternative than under any of the other alternatives.

Rebuilding Alternative 4

Rebuilding Alternative 4 constrains the catch of target species for northern fisheries. Like in Rebuilding Alternative 1, the canary rockfish OY is almost one-half of status quo; however, the yelloweye OY is less than half of status quo, a more significant reduction than that analyzed under Rebuilding Alternative 1.

The OY for darkblotched rockfish is about double that of status quo and the OY for POP is nearly five times status quo. Given this scenario, the trawl fishery would need to shift away from the nearshore and shelf, where bycatch of canary rockfish is high, and into deeper waters where darkblotched encounters are greater (but are accommodated under this alternative). The result of this shift is to limit the catch of many commercially caught shelf and nearshore target species such as petrale and Dover sole in the summer months, English sole, arrowtooth flounder, and Other Flatfish. The midwater trawl fishery for Pacific whiting is similarly constrained under this alternative as it would be under Rebuilding Alternative 1. With a low canary rockfish bycatch cap, it is possible for the non-tribal sectors of the fishery to be closed before reaching their whiting allocations. However, the fishery's demonstrated ability to reduce its bycatch of overfished species in recent years suggests that such a situation may be averted.

Commercial fixed gear and open access fisheries coastwide are constrained significantly by this alternative, due to their encounters with canary and yelloweye rockfish. Management measures would likely be similar to those described under Action Alternative 1, in which the seaward boundary of the non-trawl RCA is extended from 100 to 150 fm north of 40°10' N latitude.

Recreationally fisheries are restricted substantially or eliminated completely under this alternative due to the low canary rockfish and yelloweye rockfish OYs. This affects both bottomfish fisheries (such as black rockfish, blue rockfish, cabezon, and lingcod) as well as other recreational fisheries that catch canary rockfish and yelloweye rockfish incidentally (such as Pacific halibut). In all instances, the OYs for these target species remain largely uncaught. Although yelloweye rockfish is generally only encountered north of Cape Mendocino, canary rockfish is caught nearly coastwide (it is rarely encountered south of Point Conception). Only for these most southern fisheries, can a more liberal season be considered given the higher bocaccio and cowcod OYs.

Unlike the southern commercial fixed gear fisheries, bottom trawl fisheries in the south are relatively unconstrained under this alternative, as the bocaccio OY is approximately twice that of status quo. As a result, the attainment of target species by the southern trawl fishery is largely limited by the attainment of precautionary zone target species OYs (petrale sole and sablefish).

Rebuilding Alternative 5

The OYs under Rebuilding Alternative 5 constrain all sectors of the groundfish fishery coastwide. Yelloweye rockfish, Pacific ocean perch, canary rockfish, darkblotched rockfish, and bocaccio all constrain the catch of more abundant species as well as the remaining two rebuilding species, widow rockfish and cowcod. No target species are constraints under this alternative, and none of the target species' OYs are attained.

The complexity of managing the fisheries increases substantially under this alternative. For example, it is difficult for managers to shift a fishery from an area where the catch of a depleted species has been exceeded into another other area where less constraining depleted species are found because nearly all of the depleted species are equally constraining. This type of situation would likely bring about the early closure of some fisheries in order to avoid exceeding the rebuilding OYs.

4.3.2 Precautionary Zone Groundfish Species

[To be completed after the June Council meeting. See chapter 2 for a description of the OY alternatives for these species and Table 2-1 for the 2007-2008 Preferred OYs decided at the April Council meeting.]

4.3.2.1 Cabezon (in Waters off California)

4.3.2.2 Pacific Whiting

4.3.2.3 Petrale Sole

4.3.2.4 Sablefish

4.3.3 Healthy Groundfish Species

[To be completed after the June Council meeting. See chapter 2 for a description of the OY alternatives for these species and Table 2-1 for the 2007-2008 Preferred OYs decided at the April Council meeting.]

4.3.3.1 Arrowtooth Flounder

4.3.3.2 Bank Rockfish

4.3.3.3 Black Rockfish

4.3.3.4 Blackgill Rockfish

4.3.3.5 California Scorpionfish

4.3.3.6 Chilipepper Rockfish

4.3.3.7 Dover Sole

4.3.3.8 English Sole

4.3.3.9 Lingcod

4.3.3.10 Longspine Thornyhead

4.3.3.11 Shortbelly Rockfish

4.3.3.12 Shortspine Thornyhead

4.3.3.13 Splitnose Rockfish

4.3.3.14 Starry Flounder

4.3.3.15 Yellowtail Rockfish

4.3.4 Unassessed Groundfish Species and Those Managed as Part of a Stock Complex

[To be completed after the June Council meeting. See chapter 2 for a description of the OY alternatives for these species and Table 2-1 for the 2007-2008 Preferred OYs decided at the April Council meeting.]

4.3.4.1 Minor Rockfish South

4.3.4.1.1 Southern Nearshore Species

4.3.4.1.2 Southern Shelf Species

4.3.4.1.3 Southern Slope Species

4.3.4.2 Minor Rockfish North

4.3.4.2.1 Northern Nearshore Species

4.3.4.2.2 Northern Shelf Species

4.3.4.2.3 Northern Slope Species

4.3.4.3 Pacific Cod

4.3.4.4 Other Fish

4.3.4.5 Other Flatfish

4.3.5 Non-Groundfish Species

[To be completed after the June Council meeting.]

4.3.5.1 Salmon

[See chapter 5 for a description of salmon bycatch in groundfish fisheries]

4.3.5.2 Pacific Halibut

4.3.5.3 Coastal Pelagic Species

4.3.5.4 Highly Migratory Species

4.3.5.5 Dungeness Crab

4.3.5.6 Greenlings, Ocean Whitefish, and California Sheephead

4.3.5.7 Pink Shrimp

4.3.5.8 California Halibut

4.3.5.9 Ridgeback and Spot Prawns

4.3.5.10 Sea Cucumbers

4.4 Discussion of Cumulative Impacts

A number of natural and human-induced factors affect the status of a stock. Through data such as commercial and recreational catch estimates, length at age distributions, and larval distribution and abundance, past effects on a stock's productivity and mortality are incorporated into stock assessments and their associated rebuilding analyses. That is, a final estimate of a stock's biomass reflects the wide number of human and natural effects on the stock, both in the past and at the present time, even if these factors are not estimated explicitly in the model. (Although uncertainty with respect to the estimates in the assessments (see section 4.2) and only nascent understanding of the relationship between environmental conditions and stock status increases an assessment's overall uncertainty.) Given that the findings from a stock assessment provide the scientific basis upon which harvest specification decisions are made, it is assumed here that that the impacts of the effects found within stock assessment models are already adequately accounted for within the analysis of this action. This section, therefore, addresses factors that may impact affected species, but which are not explicitly accounted for in the stock assessments. These factors may affect a species in a number of ways, including contributing to the uncertainty that a harvest specification will maintain or rebuild the affected species' population levels and changing the genetic structure of a stock.

The actions discussed below are divided into two categories, *internal* and *external*. *Internal* refers to actions implemented as part of the management regime, while *external* refers to actions of other agencies, organizations and individuals, including broad natural or socioeconomic effects.

4.4.1 Internal Factors

4.4.1.1 VMS Implementation

In order to enforce compliance with depth-based and area-based restrictions, a common tool in management under the Groundfish FMP, a Vessel Monitoring System (VMS) program has been implemented over the past few years. In 2004, NMFS initiated a pilot program requiring all limited entry trawl and fixed gear vessels operating under the Groundfish FMP to carry and use Vessel Monitoring System (VMS) units. Beginning in 2007, this program will be expanded to include all commercial vessels that take and retain, possess, or land federally-managed groundfish species taken in federal waters or in state waters prior to transiting federal waters. Because the vessels must utilize VMS, compliance by limited entry vessels is assumed in the analysis of impacts of depth-based restrictions on affected species; therefore, the effects of the limited entry sectors' used of VMS are already considered under the current action.

The expansion of VMS into the directed open access sector in 2007, however, is considered to be a future action that may affect West Coast groundfish species. VMS deters mixed fishing strategies where vessels alter gear to catch groundfish within the RCAs. As a result, under VMS the risk of the actual catch exceeding the OYs for overfished species due to illegal fishing in the RCAs is reduced. Nevertheless, the behavior of the open access fleet under VMS can only be speculated; for example, the requirement may encourage additional targeting of groundfish by certain vessels in order to compensate for the cost of the VMS equipment. A potential indirect impact of VMS expansion is that fishing effort and location data from the vessels may improve the understanding of groundfish mortality. Data can be combined with observer, survey, and fish ticket data to better estimate total fishing mortality, impacts on juveniles and other fishery resources related to changes in fishing locations and intensity, fishing intensity (amount of time vessels are in an area), and changes in fishing location and intensity over time.

4.4.1.2 Bycatch (Amendment 18)

The Council has undertaken a number of actions in response to the 1996 amendment to the Magnuson-Stevens Act requiring measures to reduce bycatch in U.S. fisheries, as well as to a related court case, *Pacific Marine Conservation Council v. Evans*. Amendment 18 will establish catch caps and increased monitoring policies in the Groundfish FMP in order to minimize bycatch in West Coast groundfish fisheries to the extent practicable, minimize the mortality of unavoidable bycatch, and ensure that bycatch is reported and monitored as required by law. Amendment 18 was approved by NMFS in 2006. By reducing bycatch and bycatch mortality and by increasing the accuracy of total fishing mortality estimates, these new policies complement ongoing actions to rebuild depleted species. As fishing mortality is decreased through more stringent harvest restrictions, the cumulative adverse effects of fishing and its associated bycatch diminish for both depleted and healthy groundfish stocks. Therefore, it is for the less conservative harvest specification alternatives that these bycatch minimization efforts will be particularly important in providing mitigation against adverse effects.

Bycatch minimization efforts should indirectly affect West Coast groundfish stocks by improving the data used in stock assessments. Assessment models will be tuned to more precise estimates of total catch levels, which will then benefit the management specification process that uses these findings. Given that Amendment 18 will not be implemented in time to influence the 2005-2006 stock assessment cycle, the concern that unreported bycatch may adversely impact the affected species is not fully addressed within this action.

4.4.1.3 Changes to the Management Regime: Open Access Sector License Limitation and Trawl Individual Quota System

The Council is currently considering alternatives that would establish at Trawl Individual Quota (TIQ) program, with an expected implementation date of 2010. In a related action, the Council is considering transitioning the open access directed groundfish sector into a permit system for landing groundfish. Both changes to the West Coast groundfish management structure are expected to improve the accounting of fishing mortality to assure that catches do not exceed harvest specifications. More accurate catch data also would be expected to bring about improvements to stock assessments by reducing the uncertainty surrounding catch data.

4.4.1.3 Area restrictions

Since 1998, progressively restrictive depth-based and area closures (most notably RCAs) have constrained fishing activity within smaller areas of state and federal waters. Though these closures are considered to be effective tools in limiting fishing interactions with depleted species, they are also responsible for shifting additional fishing pressure into other areas and onto other species.

For example, the Oregon recreational groundfish fishery has been closed offshore of 40-fm from June through September since 2004. It is likely that due to these closures, most anglers who would have fished offshore during the closure periods instead relocated their activities inshore. The effort shift onto nearshore species that resulted contributed to the early attainment of the black rockfish harvest cap in 2004 and 2005 and to the early closure of the recreational fishery in both years. A similar effect is noted in the California recreational fishery, in which the combined effects of federal RCAs and state marine protected areas have increased the pressure on nearshore stocks. For many of these nearshore stocks, there is little data to support an assessment of its stock status, suggesting that the effect of this effort shift is difficult to monitor.

It is expected that the effects of area restrictions will persist into the future; the effects may also become more acute if depleted species' OYs are further reduced in order to rebuild the species as quickly as possible. Furthermore, in addition to the possible future expansion of RCAs, the implementation of Amendment 19 (Essential Fish Habitat) will bring about other area closures in order to protect sensitive habitat from fishing impacts. For Washington recreational fisheries, for example, a closure of fisheries seaward of 10 fm would reduce the area available (inside 60 fm) by 84%, and a 20-fathom closure would reduce the area inside 60 fm by 74%. Allowing fishing only in these smaller areas could reduce the ability of anglers to target healthy fish stocks in traditional fishing areas. Analogously, fishing pressure on groundfish stocks that may have previously been spread over a broad area could become more concentrated, increasing the potential for localized depletion of some species.

4.4.2 External Factors

4.4.2.1 Short-term and Long-term Climate Variability: ENSO (El Niño) and PDO

Most commercially important fish and shellfish stocks in the California Current system, including many groundfish, are widely acknowledged to experience moderate to substantial variability in year-to-year recruitment success. Nearly all of these stocks (particularly those of winter-spawning shelf species) experienced high (positive) recruitment anomalies in 1999, and a great many of these stocks experienced high recruitment in 2000 as well. For many stocks, these year classes are a primary factor behind the increased abundance trends presented in Table 4-2. For example, the 1999 bocaccio year class was the largest since 1989, resulting in a near doubling of stock spawning biomass between 1999 and 2005.

Similarly, many stocks also demonstrated strong recruitment in 1970, 1980, 1984 and 1990, with weak year classes tending to occur in 1976, 1982-83, 1992-93 and 1997. Multivariate analysis of the stocks' recruitment deviations suggests that a significant amount of the observed variability in recruitment for West Coast groundfish can be explained by environmental conditions that have a very similar impact to a broad range of species across a fairly broad spatial scale. Such a conclusion is also supported by survey data; for example, the Southwest Fisheries Science Center's rockfish pre-recruit survey (1983-2005) detected a strong degree of covariance in the relative abundance of pelagic juvenile rockfish from 1983 through 2005. Although this survey failed to detect the magnitude of the 1999 year class, it does show strong interannual variability throughout the 1980s, followed by a precipitous decline in relative juvenile abundance through most of the 1990s, followed in turn by a return to highly variable (but often strong) recruitment in the post-1999 era.

The timing of these recruitment synchrony events maps well onto short-term and long-term changes in ocean conditions (for further background on the relationship between El Nino events and the Pacific Decadal Oscillation and ocean conditions, see section 3.1.3. Following an intensive 1997-1998 El Nino event, ocean conditions changed dramatically, and 1999 has been described as a year of transition in long-term (decadal scale, as associated with the Pacific Decadal Oscillation, or PDO) ocean conditions by climatologists {Schwing and Peterson 2003}. The mechanisms by which climate affects recruitment are not known with certainty; however, strong recruitment years are generally associated with high southward transport in the winter period, low ocean temperatures, and high zooplankton production; these conditions parallel those present in 1999 and the years that immediately followed. Indeed, the connection between productivity and transport has long been recognized {e.g., Chelton et al. 1982}; recent observations are consistent with this finding; for example, Swartzman and Hickey {2003} describe an increase in euphausiid biomass following the 1999 shift in much of the California Current (generally south of Cape Blanco), and Feinberg and Peterson {2003} describe a dramatic increase in the duration and intensity of euphausiid spawning off Oregon between 1996 and 2001.

In that stock assessments estimate spawning biomass of a stock over time, it is reasonable to conclude that the effects of climatological events, such as El Nino and PDO, on groundfish species are accounted for within the analyses. However, with one exception, current stock assessments do not explicitly account for their effect on stock status, such as changes in fishing mortality. Only Schirripa and Colbert {2005; 2006} have integrated relative sea level (a proxy for transport) into the sablefish stock assessment as an environmental factor related to recruitment variability.

Future effects of ocean conditions on the status of affected species, on the other hand, are not encompassed within the analysis of the present action. Most notably, the criteria used to analyze impacts on depleted species, such as the time to rebuild under a constant harvest rate and the probability of successfully rebuilding the stock by T_{max}, do not account explicitly for the effects of climatological events. Indeed, although the development of statistical indices of climate variability across multiple time scales has improved our understanding of how climate has affected North Pacific ecosystems and productivity in the past, the future remains subject to poor predictability. Such uncertainty, with respect how fish productivity and the climate regime interact and with respect what and when short- and long-term climate changes will occur, brings about greater uncertainty surrounding stock assessment projections of future biomass: since predictions about future productivity are based on past relationships, between stock size and recruitment for example, if underlying conditions change, these predictions may under- or over-estimate population growth and sustainable fishery removals. For depleted species in particular, errors in prediction may lead to the need to decrease fishing effort below levels specified in the rebuilding plan in order to achieve a rebuilt stock by the target date. On the other hand, unanticipated increases in recruitment strength may allow for a quicker time to rebuild. In either case, amendments to the stock's rebuilding plan may be necessary. This environmentally-related uncertainty pertains more specifically to some depleted species (such as bocaccio, explained above) rather than to others; for species such as cowcod and widow rockfish, recruitment trends are better explained by the deterministic stock-recruitment relationship that is modeled within a stock assessment.

4.4.2.2 Spatial Effects

Under the current groundfish FMP, most stocks are managed under a coastwide OY. However, there is increasing evidence that for some stocks, a greater consideration of spatial dynamics could be appropriate, particularly with respect to minimizing the potential for localized depletion.

Berkeley et al. {2004} review examples of complex population structure in rockfish populations that suggests that only a small fraction of the spawners in a given stock contribute to successful recruitment. This can be attributed to high temporal and spatial variability in the coastal ocean that provides only limited opportunities for optimal environmental conditions that are required for successful recruitment for those species for which recruitment variability is high. Consequently, there could be increased recruitment variability, or some potential for recruitment failure, if the most reproductively important elements of a stock are depleted below target levels.

Similarly, for stocks with limited genetic exchange, overfishing of isolated population units could be possible where current stock assessments do not take such population structure into account. For example, Miller et al. {2005} found significant genetic differences among black rockfish adults collected 340–460 km apart, despite the assumption that prolonged larval duration led to widespread dispersal and minimal population structure in this species.

The risk to a species of reduced reproductive success or the depletion of genetic sub-populations is likely to increase with higher levels of fishing mortality. Alternative 3, therefore, poses the greatest risk of adverse spatial effects to depleted species, while Alternative 1 poses the least risk. In addition, alternative management measures may contribute to adverse spatial effects for a given species, as these could change the spatial and/or temporal concentration of catch (at a local and a coastwide scale) from that observed under current conditions. In all alternatives, however, the low OYs for depleted species constrain the catch of many healthy stocks to levels below their OYs, bringing about a reduction in the risk of adverse spatial effects for healthy stocks.

Many Pacific groundfish harvest specifications are structured following biogeographic zones (such as north-south divisions at Cape Mendocino and at Point Conception; see section 3.1.3 for more information). However there is not yet the science available to support spatial management at the resolution that may be necessary to reduce the risks discussed above; data limitations for stock assessment models preclude such advancement for most, if not all, West Coast groundfish species in the near term. Pelletier and Mahevas {2005} compiled a comprehensive review of fisheries and marine ecosystem simulation models and approaches that incorporated spatial dynamics, and rated the potential for each approach to address a range of ecological and fisheries related effects described as important elements of the success (or lack thereof) of implementing spatial management measures. These included restoring spawning biomass within closed areas, restoring demographic structure, increasing fecundity, enhancing fisheries yield, improving population stability and resilience, protecting biodiversity, and effecting changes in community structure. Such issues will be integral elements of fisheries science and management in the future, and advances in both assessment methods and simulation techniques should provide the means to better cope with the challenges of incorporating such complexity in the face of changing management regimes.

4.5 Summary of Impacts

4.5.1 Documentation of Impact Analysis Modeling

4.5.1.1 Modeling Limited Entry Trawl Impacts

Fleet-wide discard estimates associated with groundfish trawling are derived from WCGOP observer data and logbook and fish ticket data obtained from the Pacific Fisheries Information Network (PacFIN). Observer data are stratified by area, depth, and season. The management line at 40°10' N latitude is used to partition northern and southern areas. Bi-monthly cumulative limit periods are combined to form two seasons, representing winter (January-April and November-December) and summer (May-October). The northern area includes five depth strata, however, only four are used in the south, due to the paucity of observed trips in depths shallower than 100 fm. The number of observed tows and retained catch of target species within each stratum are reported in Table 4-15 for the 2004 fishery. For this analysis, target species include all flatfish, sablefish, and thornyheads, and also slope rockfish in the area south of 40°10' N latitude. Since regulations severely limit or eliminate the retention of rebuilding species, estimating fleet discard for those species by applying a ratio of discarded-to-landed catch to landings is not reliable. Consequently for rebuilding or bycatch species, retained target-species catch is used as a measure of effort for expanding discard from observed trips. Table 4-16 shows aggregate discard ratios for several species in each stratum. For bycatch species (upper panel), the discard ratios represent the discarded poundage for each species divided by the retained target species poundage. For target species (lower panel), the ratio of discarded-to-retained pounds is presented for each species.

Logbook data are then stratified in the same manner as observer data, and the retained amounts of individual target species are aggregated for each stratum (Table 4-17). For each target species, an initial estimate of discard is calculated by multiplying the retained poundage by the appropriate discard ratio reported in Table 4-15. For bycatch species, estimated discard is calculated by multiplying aggregate target species poundage in each stratum by the corresponding discard ratio. Logbook data do not include records for all trawl trips, and for purposes of this analysis, records without recorded depth or latitude-longitude coordinates are not included. To adjust for these factors, the discard amounts are expanded to reflect the difference in landed catch reported in fish tickets and logbooks. For target species, the expansion ratio is equal to fish ticket pounds for each species divided by the logbook pounds for each state and 2-month period. For bycatch species, the ratio of fish ticket-to-logbook poundage for combined target species is used.

Table 4-15. Number of limited entry trawl tows and retained target species poundage observed by the West Coast Groundfish Observer Program in 2004, by depth interval, area and season.

Area	Depth intervals (fm)	Winter [a/] Number of observed tows	target species [b/] retained (lbs)	Summer [a/] Number of observed tows	target species [b/] retained (lbs)
North of 40°10'					
	0-50	143	169,783	483	533,043
	51-75	164	158,449	496	646,807
	151-200	177	724,372	161	653,321
	201-300	508	2,330,542	288	1,007,533
	>300	198	709,423	170	503,181
South of 40°10'					
	0-100	47	21,858	118	153,556
	151-200	55	95,158	47	138,165
	201-300	101	398,342	119	492,927
	>300	178	676,715	104	338,339

a/ Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5.

b/ Target species are defined as all flatfish, sablefish and thornyheads in both areas and also slope rockfish in the southern area.

Table 4-16. Discard ratios for major West Coast bycatch and target species for 2004, by area and depth interval in trawl tows observed during 2004, by the West Coast Groundfish Observer Program.

	North of 40°10'						South of 40°10'				
	Depth intervals (fm)						Depth intervals (fm)				
	0-50	51-75	151-200	201-300	>300	All depths	0-100	151-200	201-300	>300	All depths
Rebuilding species											
(Ratio of species pounds discarded to total target species pounds retained)											
Lingcod	0.03356	0.04852	0.01048	0.00070	0	0.00971	0.04622	0.04403	0.00044	0	0.00807
Canary	0.00379	0.00459	0.00024	0	0	0.00078	0.00419	0	0	0	0.00031
Widow	0.00033	0.00186	0.00107	0	0	0.00040	0.00007	0.00124	0	0	0.00013
Yelloweye	0.00030	0.00006	0.00003	0	0	0.00003	0.00009	0.00000	0	0	0.00001
Bocaccio							0.01146	0.00305	0.00001	0	0.00117
Cowcod							0.00133	0.00001	0	0	0.00010
POP	0.00001	0.00027	0.03374	0.00662	0.00097	0.00983					
Darkblotched	0.00536	0.00251	0.04163	0.01414	0.00534	0.01576	0.00000	0.02385	0.00051	0.00001	0.00261
Target Species											
(Ratio of each species' discarded-to-retained pounds)											
Sablefish	0.134	0.154	0.485	0.379	0.196	0.310	0.412	0.691	0.239	0.187	0.241
Shortspine	0	0.006	0.770	0.302	0.250	0.331	0	0.786	0.350	0.319	0.328
Longspine	0	0	0.679	0.644	0.154	0.212	0	0.078	0.290	0.143	0.153
Dover	0.229	0.069	0.044	0.015	0.085	0.037	2.093	0.315	0.050	0.136	0.099
Petrale sole	0.087	0.095	0.003	0.003	0.346	0.031	0.063	0.015	0.001	0.010	0.037
English sole	0.254	0.184	0.020	0.007	0.019	0.160	0.784	0.590	0.167	0	0.669
Arrowtooth	1.271	2.868	0.073	0.078	0.084	0.247	1.983	15.936	4.879	18.246	6.043
Other Flatfish	0.174	0.386	0.120	0.068	0.566	0.181	0.070	0.825	0.155	2.948	0.160
Slope Rock.	0.002	0.191	0.314	0.228	0.059	0.259	34.632	0.287	0.080	0.026	0.189
Yellowtail	0.535	0.130	312.866	12.890	0	0.314					
Chilipepper							24.191	0.883	0.017	0.000	3.549

Table 4-17. Number of limited entry trawl tows and retained target species poundage reported in West Coast groundfish trawl logbooks for 2004.

Area	Depth intervals (fm)	Winter [a/] Number of tows	Winter [a/] target species [b/] retained (mt)	Summer [a/] Number of tows	Summer [a/] target species [b/] retained (mt)
North of 40°10'	0-50	446	120	2,854	1,134
	51-75	383	122	2,852	2,511
	151-200	744	1,083	840	1,181
	201-300	1,540	2,899	977	1,414
	>300	568	921	498	683
South of 40°10'	0-100	1,821	90	2,056	146
	151-200	166	120	255	220
	201-300	303	410	436	697
	>300	412	616	398	672

a/ Winter season includes bi-monthly periods 1, 2, 6; the Summer season includes periods 3, 4, 5.

b/ Target species are defined as all flatfish, sablefish and thornyheads in both areas and also slope rockfish in the southern area.

4.5.1.2 Modeling Limited Entry Fixed Gear Impacts

Two major strategies for the limited entry fixed gear fleet are targeting of nearshore groundfish species and targeting sablefish in both the primary fishery and the daily-trip-limit (DTL) fishery. Nearshore impact modeling methodology is described in section 4.5.1.4. Impacts in the sablefish targeting strategies are modeled as follows.

Fleet-wide discard estimates associated with fixed-gear sablefish fishing are derived from WCGOP observer data and fish ticket data obtained from PacFIN . WCGOP observation of fixed-gear vessels targeting sablefish began in 2001 and has focused on those participating in the limited-entry primary fishery. Due to the limited numbers of trips observed south of 40°10' N latitude, discard ratios are calculated through pooling all observations for 2004 within each gear group (longline and pot). Few vessels (limited entry or open access) were observed while fishing for sablefish under the "daily-trip-limit" provisions. However, in this analysis, observations from the primary fishery are assumed to be representative of bycatch and discard occurrences associated with all fixed-gear sablefish fishing north of 36° N latitude. Because there are no logbook data indicating the depth of fishing, it is not possible to apply the same depth-stratified approach used for the trawl fleet. Consequently, the coast-wide observer data are summarized, by gear, across the two depth zones where the fishery was permitted to take place in 2004: greater than 100 fm, north of 40°10' N latitude, and greater than 150 fm, south of 40°10' N latitude. As presented in Table 4-18, discarded amounts of sablefish are calculated for each gear and area, using fish ticket landings and the corresponding discard ratios. Since only a fraction of discards die, an assumed mortality percentage is applied. In accordance with the rate of survival assumed by the GMT, 20% of the discarded poundage is assumed to represent mortality. For rebuilding species, observed discard ratios relative to retained sablefish, are then used to calculate estimated amounts of mortality for each.

Table 4-18. Estimated discard of rebuilding species and sablefish associated with all fixed-gear sablefish landings north of 36^{o} N latitude during 2004.

	South of 40^{o}10' (seaward boundary of the RCA at 150 fm)			**North of 40^{o}10'** (seaward boundary of the RCA at 100 fm)			Summary for area north of 36^{o} N. Lat.
	Gear rates and discard		Combined discard	Gear rates and discard		Combined discard	
	Longline	Pot		Longline	Pot		
Sablefish							
Sets observed in each area and depth range							
number of sets	20	43		248	90		
observed sablefish catch	24,125	129,344		254,304	128,900		
Observed sets used for discard ratios in each depth range							
number of sets	146	127		268	133		
observed sablefish catch	146,045	257,357		278,430	258,243		
Total landings (mt)	**294**	**159**		**1,140**	**521**		**2,113**
Area percent, by gear	65%	35%		69%	31%		
Coast-wide percent, by gear/area	14%	8%		54%	25%		
Observed sablefish discard ratio	9.8%	42.2%		11.5%	42.1%		21.1%
Total estimated discard	29	67		131	219		446
Estimated discard mortality[a/] (mt)	6	13		26	44		89
Estimated total mortality	**300**	**172**		**1,166**	**564**		**2,203**
Rebuilding species discard ratios [b/]							
Lingcod	0.018%	0.273%		0.144%	0.284%		
Canary rockfish	0.016%	0%		0.101%	0%		
Widow rockfish	0%	0%		0%	0%		
Yelloweye rockfish	0.023%	0%		0.089%	0%		
Bocaccio rockfish [c/]	0%	0%		0%	0%		
Cowcod rockfish [c/]	0%	0%		0%	0%		
Pacific ocean perch	0%	0%		0.002%	0.002%		
Darkblotched rockfish	0.042%	0.009%		0.029%	0.009%		
Estimated rebuilding species discard (mt)							
Lingcod	0.1	0.4	**0.5**	1.6	1.5	3.1	**3.6**
Canary rockfish	0.0	0.0	**0.0**	1.1	0.0	1.1	**1.2**
Widow rockfish	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Yelloweye rockfish	0.1	0.0	**0.1**	1.0	0.0	1.0	**1.1**
Bocaccio rockfish [c/]	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Cowcod rockfish [c/]	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Pacific ocean perch	0.0	0.0	**0.0**	0.0	0.0	0.0	**0.0**
Darkblotched rockfish	0.1	0.0	**0.1**	0.3	0.0	0.4	**0.5**

a/ As assumed by the Groundfish Management Team, the rate of mortality for discarded sablefish in the fixed gear fishery is assumed to be 20%.

b/ Discard ratios are calculated by dividing the total discarded weight of each species by the retained catch weight of sablefish, and are derived from data collected by the West Coast Groundfish Observer Program during the 2004 limited entry fixed gear primary fishery.
c/ Please note that the observer data include few observations from south of Ft. Bragg, CA, so these rates may underestimate the true bycatch of these species.

4.5.1.3 Modeling Open Access Impacts

Open access impacts are modeled using the limited entry fixed gear sablefish impact methodology described in the previous section for the directed open access strategies targeting sablefish (i.e., the daily-trip-limit fishery). Modeling impacts for that portion of the open access fishery targeting nearshore groundfish species is described in the following section.

4.5.1.4 Modeling Nearshore Commercial Impacts

Fleet-wide discard estimates associated with near-shore groundfish fishing are derived from observer data, fish ticket data obtained from PacFIN, and other parameters developed by the GMT. WCGOP began pilot coverage of vessels targeting near-shore rockfish and associated species, such as cabezon and kelp greenling, in 2003. Data collected from these vessels from January 2003 through August 2004 were summarized in a report published on the NWFSC web site in May of 2005 (http://www.nwfsc.noaa.gov/research/divisions/fram/observer/datareport/nearshore/datareport_nearshore_may2005.cfm). Data from the remainder of 2004 have not yet been released. It should be noted that the coverage of observed trips and tonnage reported in Table 4-19 reflect lower levels of coverage than for other fleets, and in turn greater uncertainty in estimating discard relationships. Table 4-20 summarizes bycatch ratios for rebuilding species and the number of observed gear sets used to calculate them. Table 4-21 summarizes the observed catch weight of target and rebuilding species, and the percentage of each species or species-group's catch that was discarded.

Table 4-19. Number of observed open access, fixed gear trips occurring at less than 50 fm and associated landed tonnage, by port group and gear from January 1, 2003 to August 31, 2004.

Port Group	Hook and Line [a/]		Pot [a/]	
	Number of trips	Landed catch (mt)	Number of trips	Landed catch (mt)
Astoria	16	1.2	b/	
S Oregon	71	7.3		
Crescent City	114	14.6		
Fort Bragg	12	0.3	10	0.3
Monterey	24	1.2		
Morro Bay	77	3.9	12	2.5
Santa Barbara	15	0.6	15	1.8
Los Angeles	31	0.7	32	3.2
ALL PORTS	360	29.7	b/	

a/ Since both gear groups were used on some trips, the total number of observed trips is less than the sum of the numbers shown for each gear group in this table.

b/ Data not reported because of confidentiality issues.

Table 4-20. Ratios of bycatch, for eight[a/] rebuilding species, per 100 pounds of retained nearshore target species, by area and depth, from open access fixed gear sets observed between January 1, 2003 and August 31, 2004 by the West Coast Groundfish Observer Program.

	0 - 10 fm	11 - 20 fm	21 - 50 fm
North of 40°10'			
Number of applicable observed sets	152	173	19
Species catch per 100 lb of retained nearshore species			
Canary Rockfish	0.413	1.646	5.344
Lingcod	27.593	36.700	73.092
Widow Rockfish	0.024	0.021	0.173
Yelloweye Rockfish	0.142	1.109	9.404
South of 40°10'			
Number of applicable observed sets	254	68	
Species catch per 100 lb of retained nearshore species			
Canary Rockfish	0.012	1.756	Insufficient data
Lingcod	23.936	33.773	
Widow Rockfish	0	0	
Yelloweye Rockfish	0	0	

a/ No bycatch of bocaccio, cowcod, darkblotched rockfish or Pacific ocean perch were observed in these sets.

Table 4-21. Discard percentages for target and rebuilding species, by area and depth, from open access fixed gear sets observed between January 1, 2003 and August 31, 2004 by the West Coast Groundfish Observer Program.

Area / Species	0 - 10 fm		11 - 20 fm		21 - 50fm		All Depths	
	Total lbs	Discard % [a/]	Total lbs	Discard % [a/]	Total lbs	Discard % [a/]	Total lbs	Discard % [a/]
North of 40°10'								
Target species								
Black Rockfish	15,193	2%	16,189	1%	744	0%	32,125	1%
Blue Rockfish	912	16%	2,431	12%	182	14%	3,525	14%
Other minor nearshore rockfish	601	6%	1,530	5%	1,043	2%	3,175	4%
Cabezon	1,471	21%	2,467	21%	184	20%	4,122	21%
Kelp Greenling	988	23%	1,570	18%	83	14%	2,641	20%
Rebuilding species								
Canary Rockfish	66	100%	308	99%	85	100%	458	100%
Widow Rockfish	4		4		3		11	
Yelloweye Rockfish	23	100%	207	100%	150	100%	379	100%
Lingcod [b/]	4,408	43%	6,860	40%	1,164	15%	12,431	39%
South of 40°10'								
Target species								
Shallow nearshore species	4,347	24%	943	52%	54	40%	5,344	29%
Deeper nearshore species	1,920	18%	2,234	13%	27	100%	4,181	16%
Kelp Greenling	1,588	62%	19	87%	10	100%	1,617	62%
Cabezon	10,864	29%	263	72%	33	100%	11,160	30%
California Sheephead	13,199	36%	2,702	35%	239	15%	16,141	35%
Rebuilding species								
Bocaccio Rockfish					27	8%	27	8%
Canary Rockfish	2	100%	63	100%	6	100%	72	100%
Lingcod [b/]	4,422	42%	1,258	56%	24	56%	5,704	45%

a/ The percentage discarded is calculated as the discard poundage divided by the total catch weight for each species.

b/ Lingcod was declared rebuilt in 2005.

In May 2005, the values presented in Tables 4-20 and 4-21 were used by the GMT, in conjunction with other information provided by Team members, in constructing the framework for evaluating discard in the nearshore fisheries presented in Tables 4-22 and 4-23. For the purposes of estimating 2004 discard in nearshore groundfish fisheries, the framework and parameters developed by the GMT have not been updated, except for the target species landed catch amounts. However, an overview of the process embodied in these two tables is presented below for purposes of clarity. Table 4-22 summarizes the calculation of discard for target species. Landed weights for each species/group are expanded to total catch estimates, using all-depth retention rates. Using observer and state-agency information, total catch is then distributed among 3 depth intervals: 0-10 fm, 11-20 fm, and 21-50 fm. Within each of those strata, depth-specific gross discard and mortality estimates are calculated using observed discard ratios and assumed rates of discard survival. The estimated retained catch of all target species within each area/depth stratum is used with observer-derived discard ratios to estimate the discard mortality of rebuilding species in these fisheries (Table 4-23).

Table 4-22. Estimated nearshore target species discard mortality, derived using the Groundfish Management Team nearshore model with 2004 landed catches.[a]

Area / Species	All depths			0 - 10 fm							11 - 20 fm						
	landed catch (mt)	retention rate	total catch (mt)	% of total catch	stratum catch	gross discard		discard mortality		stratum mortality	% of total catch	stratum catch	gross discard		discard mortality		stratum mortality
					mt	%	mt	%	mt	mt		mt	%	mt	%	mt	mt
South of 40°10'																	
Shallow nearshore species	**42**	71%	59	81%	48	24%	12	15%	1.7	38	18%	10	52%	5	45%	2.4	7
Deeper nearshore species	**46**	84%	55	43%	24	17%	4	10%	0.4	20	53%	29	13%	4	40%	1.5	27
Cabezon	**47**	70%	67	97%	65	29%	19	7%	1.3	48	2%	2	72%	1	7%	0.1	1
Kelp Greenling	**2**	38%	5	98%	5	62%	3	7%	0.2	2	1%	0	87%	0	7%	0.0	0
All nearshore groundfish	**137**	74%	184	77%	142	26%	37	10%	3.7	108	23%	41	25%	10	39%	4.0	35
North of 40°10'																	
Black Rockfish	**180**	99%	183	47%	87	2%	2	10%	0.2	85	50%	92	1%	1	40%	0.4	92
Blue Rockfish	**12**	86%	13	26%	3	16%	1	10%	0.1	3	69%	9	12%	1	40%	0.4	9
Other minor nearshore rockfish	**39**	96%	41	55%	22	6%	1	20%	0.3	21	35%	14	5%	1	50%	0.4	14
Cabezon	**30**	79%	38	36%	14	21%	3	7%	0.2	11	60%	23	21%	5	7%	0.3	19
Kelp Greenling	**24**	80%	29	37%	11	23%	3	7%	0.2	9	59%	17	18%	3	7%	0.2	15
All nearshore groundfish	**285**	94%	303	45%	137	7%	9	10%	0.9	129	52%	156	7%	11	16%	1.7	147

Table 4-22. Estimated nearshore target species discard mortality, derived using the Groundfish Management Team nearshore model with 2004 landed catches (continued).[a/]

Area / Species	21 - 50 fm							0 - 50 fm			
	% of total catch	stratum catch	gross discard		discard mortality		stratum mortality	mortality from:			discard as a percentage of mortality
		mt	%	mt	%	mt	mt	landings (mt)	discard (mt)	total (mt)	
South of 40°10'											
Shallow nearshore species	1%	1	60%	0.4	100%	0.4	1	42	4.5	46.3	9.8%
Deeper nearshore species	4%	2	60%	1.3	100%	1.3	2	46	3.2	49.5	6.5%
Cabezon	0%	0	75%	0.1	7%	0.0	0	47	1.4	48.3	2.9%
Kelp Greenling	1%	0	90%	0.0	7%	0.0	0	2	0.2	2.0	10.4%
All nearshore groundfish	2%	3	61%	1.9	91%	1.7	3	137	9.4	146.1	6.4%
North of 40°10'											
Black Rockfish	2%	4	0%	0.0	100%	0.0	4	180	0.5	180.9	0.3%
Blue Rockfish	5%	1	14%	0.1	100%	0.1	1	12	0.6	12.2	4.9%
Other minor nearshore rockfish	10%	4	2%	0.1	100%	0.1	4	39	0.7	39.7	1.8%
Cabezon	4%	2	20%	0.3	7%	0.0	1	30	0.6	31.0	1.8%
Kelp Greenling	3%	1	14%	0.1	7%	0.0	1	24	0.4	23.9	1.7%
All nearshore groundfish	4%	12	6%	0.7	33%	0.2	11	285	2.8	287.7	1.0%

a/ The model uses discard and retention percentages reported by the West Coast Groundfish Observer Program from data collected between January 1, 2003 and August 31, 2004.

Table 4-23. Groundfish Management Team nearshore model for estimating target species' discard mortality, with 2004 landed catches.

	0 - 10 fm	11 - 20 fm	21 - 50 fm	Estimated bycatch (mt)			
				0 - 10 fm	11 - 20 fm	21 - 50 fm	0 - 50 fm
South of 40°10'							
Retained nearshore mt	104	31	1.2				
Rebuilding species		*Bycatch rates*					
Canary	0.01%	1.76%	1.76%	0.01	0.55	0.02	0.58
disc. mort. (%:mt)	10%	55%	100%	0.00	0.30	0.02	**0.32**
Lingcod							
catch (%:mt)	23.40%	33.77%	33.77%	24.44	10.49	0.40	35.33
landed (%:mt)	58%	44%	55%	14.18	4.62	0.22	19.01
discard (%:mt)	42%	56%	45%	10.27	5.88	0.18	16.32
disc. mort. (%:mt)	7%	7%	7%	0.72	0.41	0.01	1.14
total mortality				14.89	5.03	0.23	**20.15**
North of 40°10'							
Retained nearshore mt	128	145	11				
Rebuilding species		*Bycatch rates*					
Canary	0.41%	1.65%	5.34%	0.53	2.39	0.59	3.51
disc. mort. (%:mt)	10%	55%	100%	0.05	1.32	0.59	**1.96**
Widow	0.02%	0.02%	0.17%	0.03	0.03	0.02	**0.08**
Yelloweye	0.14%	1.11%	9.40%	0.18	1.61	1.03	2.83
disc. mort. (%:mt)	50%	90%	100%	0.09	1.45	1.03	**2.58**
Lingcod							
catch (%:mt)	27.59%	36.70%	73.09%	35.34	53.40	8.03	96.76
landed (%:mt)	57%	60%	85%	20.14	32.04	6.83	59.00
discard (%:mt)	43%	40%	15%	15.19	21.36	1.20	37.76
disc. mort. (%:mt)	7%	7%	7%	1.06	1.50	0.08	2.64
total mortality				21.21	33.53	6.91	**61.65**
Estimated coast-wide discard mortality associated with near-shore groundfish targets							
					Canary		**2.28**
					Widow		**0.08**
					Yelloweye		**2.58**
					Lingcod		**3.79**

4.5.1.5 Modeling Tribal Fishery Impacts

Background

From 1991 to 2002, Makah fishermen have employed trawl gear on a limited, exploratory basis. Recently, trawl fisheries have been developed to diversify harvest strategies and maximize fisheries production (vessels must choose between trawling and longlining and cannot engage in both). The trawl fleet had eight vessels in 2003 and expanded to the current fleet limit of 10 vessels in 2004. They pursue two basic strategies – bottom (small footrope) and midwater (pelagic) trawl. The majority of the fleet participates in both strategies though some specialize in one or the other. The bottom trawl fishery targets flatfish (primarily Dover, English, and petrale soles and arrowtooth flounder) and Pacific cod, while the midwater fishery targets yellowtail rockfish. In an agreement with the National Marine Fisheries Service and the Pacific Fishery Management Council, the Makah Tribe implemented an observer program in 2003 to monitor maximum retention compliance in the newly developed trawl fisheries. The observer program has a monthly (and overall annual) sampling rate target of 15% of all trips and is administered by a cooperative agreement between the Makah Tribe, Northwest Indian Fisheries Commission, and Washington Department of Fish and Wildlife.

Current Management

Makah Fisheries Management has developed trip limits for the trawl fleet for each of two strategies – bottom and midwater – that maximize production, while discouraging both interactions with overfished species and conflicts (i.e., preempting another fleet's opportunity) with their groundfish directed longline fleet (Tables 4-24 and 4-25). While trip limits are in place to discourage targeting on several species, especially overfished rockfishes (e.g., canary), maximum retention is required. Maximum retention in this case is defined as full retention of all marketable species, with particular emphasis on canary and widow rockfishes. Any trip limit overages are sold and the proceeds forfeited to the Tribe.

Table 4-24. Trip limits for the tribal midwater trawl fishery for both 2003 and 2004.

SPECIES	TRIP LIMITS
Yellowtail rockfish	≤ 30,000 lbs/trip
Widow rockfish	≤ 10% of yellowtail
Canary rockfish	300 lbs/trip
Minor shelf rockfish	300 lbs/trip
Minor slope rockfish	300 lbs/trip
Minor nearshore rockfish	300 lbs/trip
Thornyheads (long- and shortspine combined)	300 lbs/trip
Other species	Same as initial Limited Entry (LE) trawl N of 40° 10'

Table 4-25. Trip and/or cumulative limits for the tribal bottom trawl fishery for 2003 and 2004.

SPECIES	2003 LIMITS	2004 LIMITS
Petrale sole	30,000 lbs/2 mo	30,000 lbs/2 mo
Arrowtooth flounder	60,000 lbs/2 mo	30,000 lbs/trip
All other flatfish	100,000 lbs/2 mo	100,000 lbs/2 mo
Lingcod	300 lbs/day (not to exceed 900 lbs/week)	450 lbs/day (not to exceed 1,350 lbs/wk)
Sablefish	6,000 lbs/yr dressed wt	6,000 lbs/yr dressed wt
Yellowtail rockfish	5,000 lbs/mo	3,000 lbs/trip
Widow rockfish	≤ 10% of yellowtail/trip	≤ 10% of yellowtail/trip
Canary rockfish	300 lbs/trip	300 lbs/trip
Minor shelf rockfish	300 lbs/trip	300 lbs/trip
Minor slope rockfish	300 lbs/trip	300 lbs/trip
Minor nearshore rockfish	300 lbs/trip	300 lbs/trip
Thornyheads (long- and shortspine combined)	300 lbs/trip	300 lbs/trip
Other species	Same as initial LE trawl N of 40° 10’	Same as initial LE trawl N of 40° 10’

Since canary rockfish is the primary constraint in both strategies, management centers on its avoidance. The two strategies may be open simultaneously (though most fishermen with midwater nets will prosecute that strategy when available) and are closed whenever bycatch rates appear elevated. The bottom trawl fishery has a small footrope requirement (≤ 8 inches) that reduces rockfish interactions by preventing access to reefs, rocky substrate, and other high-relief areas. The midwater fishery uses pelagic nets and is managed with a combination of time and area closures to minimize impacts on canary and widow rockfishes.

Midwater trawl areas are defined by latitudinal and longitudinal coordinates in regulations. An area is opened after two vessels with full observer coverage make exploratory trips to verify that bycatch rates are low enough to prosecute the fishery. An area is closed whenever bycatch rates appear elevated. The fishery is also closed June-August based on anecdotal evidence from fishermen that canary rockfish bycatch is highest in these months. Trip limits are usually 30,000 pounds/2 month period, but may be adjusted upwards to a maximum of 30,000 pounds/trip if bycatch appears minimal and few vessels are participating.

Methods

Observations are conducted by the port sampler operating out of Neah Bay, WA. Vessels must contact an observer hotline 24 hours prior to departure stating the date and time of departure and expected duration of the trip. Vessels are selected in a quasi-random manner based on availability of the observer in coordination with his other duties (i.e., dockside sampling and data entry). Data collected include gear type, tow duration, average depth, start and end location, and pounds discarded and retained. Priority is given, in decreasing order, to verifying maximum retention, quantifying discard of halibut and their disposition (not covered in this report), and quantifying all other discard species.

Bycatch rates were measured as total catch (retained + discard, if any) of bycatch species divided by landed catch of target species in pounds – similar to the method employed by the West Coast Groundfish Observer Program. While tow-by-tow data are collected by the observer, corresponding information is not available for unobserved trips making it difficult to attribute bycatch to a particular bottom trawl target strategy. Instead, bycatch rates for bottom trawl are reported for primary flatfish targets combined (petrale, English, and Dover soles and arrowtooth flounder), all flatfish combined, Pacific cod, and all targets combined (i.e., Pacific cod plus all flatfish). Target species are divided into these categories to help determine if bycatch of canary can more readily be attributed to flatfish fishing or Pacific cod fishing. The midwater trawl fishery targets only yellowtail rockfish. Bycatch of canary rockfish is measured for both bottom and midwater trawl fisheries. Bycatch of widow rockfish in midwater trawl is also examined.

Comparisons of observed versus unobserved landings by year were conducted for each strategy to test for differences in retention of select overfished species. Separate analyses were performed for vessels that carried an observer (paired *t* test) and all vessels combined (i.e. including those vessels that had no observer coverage during the year). For all vessels combined the assumption of equal variance was tested and the appropriate *t* test performed. Comparisons of canary rockfish associated with primary flatfish, Pacific cod, and all target species combined were conducted for bottom trawl. Comparisons based on all flatfish landings were not performed, since other flatfish (i.e., non-primary species) are not specifically targeted and change bycatch rates very little. Both widow and canary rockfish associated with yellowtail rockfish were examined for midwater trawl. Comparisons across years were not performed to avoid confusion of interannual variation in species availability or targeting strategy with fishing behavior associated with carrying an observer.

Results

Bottom Trawl

In 2003 there were 23 sampled trips out of 175 total trips (13.1%). Coincidentally, 23 of 221 total trips (10.4%) were also sampled in 2004. Discard in both years consisted primarily of Pacific whiting, spiny dogfish, unmarketable flatfish, and other unmarketable fishes (Table 4-26). Bycatch rates for all landings by target and year are provided in Table 4-27.

Table 4-26. Observed tribal bottom trawl discard in pounds by species or species group by year.

Species	2003	2004
Pacific whiting	11,000	5,097
Spiny dogfish	9,534	9,231
Arrowtooth flounder	1,982	6,250
Unspecified skates	1,485	4,723
Unspecified sole	1,219	1,484
Ratfish	1,180	3,361
Pollock	120	503
Minor shelf rockfish	30	104

Table 4-27. Total fleet bycatch rates (measured as pounds of canary rockfish in the tribal bottom trawl fishery divided by pounds of target category) by year.

Target	2003	2004
Primary flatfish	0.00138	0.00223
All flatfish	0.00131	0.00212
Pacific cod	0.00137	0.00249
All targets	0.00067	0.00115

Two-tailed paired *t* tests found no significant difference between observed and unobserved trips for vessels that carried an observer during the season for either year (Table 4-28). Canary catches per combined primary flatfish landings were not significantly different. Similarly, canary catches associated with Pacific cod and all targets combined were not significantly different.

Table 4-28. Yearly comparisons of canary rockfish bycatch rates (measured as pounds of canary rockfish divided by pounds of target category) for tribal bottom trawl vessels that carried an observer at least once during a season.

Year	Target Species	Mean Bycatch Rates		d.f.	*t*	*p*
		Observed	Unobserved			
2003	Primary flatfish	0.00121	0.00198	6	0.79	0.46
	Pacific cod	0.00202	0.00344	6	-0.60	0.57
	All Targets	0.00059	0.00113	6	-0.89	0.41
2004	Primary flatfish	0.00772	0.00343	5	0.79	0.47
	Pacific cod	0.03807	0.00312	5	1.19	0.29
	All Targets	0.00619	0.00127	5	1.15	0.30

Two-tailed *t* tests also found no significant difference between all observed and unobserved trips in either year (Table 4-29). Canary bycatch rates associated with primary flatfish were not significantly different. For Pacific cod, observed versus unobserved trips in 2004 had unequal variances $F\ (5, 9) = 23.62$, $p < 0.01$ and were not significantly different in either year. Bycatch rates of canary for all targets combined also were not significantly different.

Table 4-29. Yearly comparisons of canary rockfish bycatch rates (measured as pounds of canary rockfish divided by pounds of target category) for all observed and unobserved tribal bottom trawl vessels.

Year	Target Species	Mean Bycatch Rates		d.f.	*t*	*p*
		Observed	Unobserved			
2003	Primary flatfish	0.00106	0.00143	16	-0.43	0.67
	Pacific cod	0.00176	0.00245	16	-0.38	0.71
	All Targets	0.00052	0.00085	16	-0.68	0.50
2004	Primary flatfish	0.00772	0.00750	14	0.03	0.98
	Pacific cod	0.03807	0.00663	5	1.07	0.33
	All Targets	0.00619	0.00330	14	0.64	0.53

Midwater Trawl

The observer sampled 5 out of 34 trips (16.0%) in 2003, and 11 of 53 trips (20.8%) in 2004. Discard consisted of Pacific whiting, minor shelf rockfish, minor slope rockfish, and dogfish (Table 4-30). Bycatch rates of widow and canary in all landings are provided in Table 4-31.

Table 4-30. Observed tribal midwater trawl discard in pounds by species or species group by year.

Species	2003	2004
Pacific whiting	3270	0
Minor shelf rockfish	450	1175
Minor slope rockfish	63	575
Spiny dogfish	0	70

Table 4-31. Total fleet bycatch rates (measured as pounds of canary or widow rockfish divided by pounds of yellowtail rockfish) in the tribal midwater trawl fishery by year.

Species	2003	2004
Canary	0.00168	0.00350
Widow	0.04263	0.06767

Two-tailed paired *t* tests found no significant difference in bycatch between observed and unobserved trips on vessels that carried an observer at some point in the season (Table 4-32). In 2003 there was no significant difference for canary or widow. There was also no significant difference in 2004 for either canary or widow.

Table 4-32. Yearly comparisons of canary and widow rockfish bycatch rates (measured as pounds of bycatch divided by pounds of yellowtail) for tribal midwater trawl vessels that carried an observer at least once during a season.

Year	Species	Mean Bycatch Rates		d.f.	*t*	*p*
		Observed	Unobserved			
2003	Canary	0.00351	0.00289	2	0.27	0.81
	Widow	0.05353	0.03335	2	0.60	0.61
2004	Canary	0.00651	0.00213	5	1.81	0.13
	Widow	0.07209	0.06719	2	0.30	0.78

In comparisons of all observed versus unobserved trips, two-tailed *t* tests detected no significant differences in bycatch (Table 4-33). Variances for canary bycatch were unequal in observed and unobserved trips for 2003 and 2004 $F\ (2, 7) = 9.57$, $p < 0.01$ and $F\ (5, 10) = 5.90$, $p < 0.01$ respectively. The difference in canary bycatch was not significantly different in either year, though in 2004 the difference is characterized as being of "borderline" significance. No significant differences were detected for widow bycatch in either year.

Table 4-33. Yearly comparisons of canary and widow rockfish bycatch rates (measured as pounds of bycatch divided by pounds of yellowtail) for all observed and unobserved tribal midwater trawl vessels.

Year	Species	Mean Bycatch Rates		d.f.	*t*	*p*
		Observed	Unobserved			
2003	Canary	0.00351	0.00124	2	0.72	0.55
	Widow	0.05353	0.07671	9	-0.39	0.70
2004	Canary	0.00651	0.00175	6	2.13	0.08*
	Widow	0.07209	0.05421	15	1.16	0.26

* Difference in canary bycatch rates in 2004 was of borderline significance.

Discussion

Bycatch rates for a particular species can vary considerably within a fleet and for a variety of reasons. Annual variations in distribution or abundance can affect encounters, as can effort and the times and areas fished. This is especially true for patchily distributed animals such as canary and widow rockfishes. In both bottom and midwater trawl fisheries the encounter rate of canary was considerably higher in 2004 than in 2003 (71.6% and 108.3% respectively). The bycatch rate of widow rockfish in the midwater fishery was 58.7% higher in 2004. These increases may also reflect expanding effort (though not capacity) within the trawl fleet as a whole. Some level of increasing impacts may be due to what has been termed the “rebuilding paradox.” The paradox is that as overfished species rebuild, they are more likely to be encountered by fishermen trying to avoid them. Estimating the relative influence of these factors will require more data collection and further, detailed analyses.

One interesting effect of increased occurrences of canary rockfish in the 2004 midwater fishery was the prosecution of more observed, exploratory trips to determine if bycatch rates were low enough to conduct the fishery in a given area. Observed vessels engaged in exploratory trips can be expected to have higher bycatch rates than unobserved vessels operating in verified low bycatch areas. This is likely what led to the borderline significant low *p*-value for observed versus unobserved that year. Differentiating observed exploratory trips from other observed trips may lead to more comparable observed versus unobserved bycatch rates. Despite large interannual variation of bycatch rates for these two years, the values measured can still inform management. Examination of bycatch rates over many years could detect patterns, and averages across years weighted toward more recent years can mitigate some of the negative effects of the rebuilding paradox on the fishery as well as reflecting changes in fleet behavior (i.e., if more recent years are likely to be more similar to the upcoming season, preseason planning is improved). If preseason planning is based on accurate expectations of bycatch, inseason management (e.g., time and area restrictions) is likely to be more effective at staying within estimated impacts.

Combining maximum or full retention policies with an observer program to verify the accuracy of bycatch accounting can greatly benefit both the fleet and the resource. In other words, if observed bycatch rates are not significantly different than unobserved bycatch rates, managers can be reasonably certain that landings reflect total mortality for overfished species and fishermen can continue to access healthy stocks. This combination can also prove very cost effective where other programs might not be economically feasible (e.g., full observer coverage). With this method, estimates of total removals can be verified, bycatch rate estimates refined, and better preseason and inseason management can be achieved. In this case, the lack of significant differences between bycatch rates in observed versus unobserved trips shows that the maximum retention program is working and landings are a reasonable estimation of actual impacts.

4.5.1.6 Modeling Washington Recreational Impacts

<u>Washington Recreational Fishery Sampling and Catch Estimates</u>

The Washington Ocean Sampling Program (OSP) generates catch and effort estimates for the recreational boat-based groundfish fishery which are provided to Pacific States Marine Fisheries Commission (PSMFC) and incorporated directly into RecFIN. The OSP provides catch in total numbers of fish, and also collects biological information on average fish size, which is provided to RecFIN to enable conversion of numbers of fish to total weight of catch. Boat egress from the Washington coast is essentially limited to four major ports, which enables a sampling approach to strategically address fishing effort from these ports. Effort estimates are generated from exit-entrance counts of boats leaving coastal ports while catch per effort is generated from angler intercepts at the conclusion of their fishing trip. The goal of the program is to provide information to RecFIN on a monthly basis with a one-month delay to allow for inseason estimates. For example, estimates for the month of May would be provided at the end of June. Some specifics of the program are:

Exit/Entrance Count

Boats are counted either leaving the port (4:30 AM - end of the day) or entering the port (approximately 8:00 AM through end of the day) to give a total count of sport boats for the day.

Interview

Boats are encountered systematically as they return to port; anglers are interviewed for target species, number of anglers, area fished, released catch data and depth of fishing (non-fishing trips are recorded as such and included in the effort expansion). The OSP only collects information on released catch and does not collect information on the condition of the released fish. Therefore, released catches must be post-stratified as live or dead based upon an assumed discard mortality rated. Onboard observers are deployed throughout the sampling season primarily to observe hatchery salmon mark rates but also collect rockfish discard information for halibut charter trips.

Examination of Catch

Catch is counted and speciated by the sampler. Salmon are electronically checked for coded wire tags and biodata is collected from other species.

Sampling Rates

Sampling rates vary by port and boat type. Generally, at boat counts less than 30, the goal is 100% coverage. The sampling rate goal decreases as boat counts increase (e.g., at an exit count of 100, sample rate goal is 30%; over 300, sample rate goal is 20%). Overall sampling rates average approximately 50% coastwide through March-October season.

Sampling Schedules

Due to differences in effort patterns, weekdays/weekend days are stratified. Usually, both weekend days and a random 3 of 5 weekdays are sampled.

Personnel

OSP sampling staff include two permanent biologists coordinating data collection, approximately twenty-two port samplers, four on-board observers and one data keypuncher.

Volume of Data

Between 20,000 and 30,000 boat interviews completed per season coastwide.

Data Expansion

Algorithm for expanding sampled days:

$$\frac{\text{Exit Count}}{\text{Total boats sampled}} * P_s \text{ sampled} = P_t$$

where P_s = any parameter (anglers, fish retained, fish released) within a stratum,
and P_t = total of any parameter with stratum for the sample day

Algorithm for expanding for non-sampled days:

$$\text{Total Weekday Catch} = \frac{\Sigma(P_t) \text{ on sampled weekdays}}{\text{number weekdays sampled}} * \text{ no. of weekdays in stratum}$$

$$\text{Total Weekend Catch} = \frac{\Sigma(P_t) \text{ on sampled weekend days}}{\text{number weekend days sampled}} * \text{ no. weekend days in stratum}$$

Total weekend catch + total weekday catch = total catch in stratum

Notes on Data Expansion:
Salmon and halibut catches are stratified by week; all other species are stratified by month. All expansions are stratified by boat type (charter or private), port, area and target species trip type (e.g., salmon, halibut, groundfish, and albacore).

Washington Recreational Fishery Impact Modeling

Pre-Season Catch Projections

Projected impacts for Washington's recreational fishery are essentially based upon the previous season's harvest estimated by the Ocean Sampling Program (OSP) and incorporated in RecFIN. This is especially true if recreational regulations remain consistent.

However, in 2005, the Washington Department of Fish and Wildlife implemented a depth restriction of 30 fm for a portion of the Washington coast. Since 2002, the OSP program began collecting fishing depth as well as discard information. This information is keypunched and analyzed on an annual basis with respect to depth of catch for species of concern. Beginning in 2006, and carrying through 2007 and 2008, we have modified our pre-season catch projections, based on the use of depth restrictions, by sub-area and fishery. The Washington recreational management measures include prohibiting fishing deeper than 10, 20, or 30 fm (depending upon time and management sub-area); therefore, the depth analysis was re-structured to determine the catch and mortality of discarded fish relative to these depths, as follows:

Canary Rockfish

- Apply 100% mortality rate to canary rockfish caught on all recreational fishing trips targeting Pacific halibut, when there is no depth restriction in place
- Apply 66% mortality rate to canary rockfish on recreational fishing trips targeting species other than Pacific halibut, when there is no depth restriction in place
- When a 20-fm depth restriction is in place, apply a 50% mortality rate to canary rockfish caught on all recreational fishing trips (based on research by Albin and Karpov, 1995).
- When a 10-fm depth restriction is in place, apply a 10% mortality rate to canary rockfish caught on all recreational fishing trips.
- When a 10- or 20-fm depth restriction is in place, there may be a reduced encounter rate of canary rockfish, but this is not included in the model.

Yelloweye Rockfish

- Apply 100% mortality rate to yelloweye rockfish caught on all recreational fishing trips, when there is no depth restriction in place
- When a 20-fm depth restriction is in place, apply a 50% mortality rate to yelloweye rockfish caught on all recreational fishing trips (based on research by Albin and Karpov, 1995).
- When a 20-fm depth restriction is in place, apply an encounter rate reduction of 25% (based on 2005 OSP catch-by-depth data) as yelloweye tend to inhabit deeper depths.
- When a 10-fm depth restriction is in place, apply a 10% mortality rate to yelloweye rockfish caught on all recreational fishing trips.
- When a 10-fm depth restriction is in place, the yelloweye encounter rate is likely reduced from the rate inside 20 fm, but this is not included in the model.

Inseason Catch Projections

Inseason catch projections are based upon the most recent OSP estimates (with a one-month time lag) with subsequent months extrapolated from the pre-season catch projections. This includes producing inseason reports of discard information for prohibited species such as yelloweye and canary. However, it should be noted that the precision of recreational groundfish catch estimates based upon previous seasons will continue to be influenced by factors such as the length and success of salmon and halibut seasons, weather and other unforeseen factors.

4.5.1.7 Modeling Oregon Recreational Impacts

Data Source for Base Model

Modeling of estimated impacts in the 2007-2008 Oregon recreational groundfish fishery was based on recent year estimates of landings and discards. For the ocean boat fishery, the data source was the Oregon Department of Fish and Wildlife's (ODFW) Ocean Recreational Boat Survey (ORBS). For the shore and estuary fishery, the data source was the Marine Recreational Fishery Statistical Survey (MRFSS). Analyzed species include black, blue, brown, canary, china, copper, grass, quillback, vermilion, tiger, widow, and yelloweye rockfishes; as well as kelp and rock greenlings, cabezon and lingcod.

Landings and discards for the ocean boat fishery (in numbers of fish) were initially based on normalized 2004 and 2005 landings and discards because these data most closely reflect regulations expected in 2007-2008 (i.e., bag limits, effort shifts to avoid overfished and harvest capped species, etc.). The 2004 season reflected very good salmon opportunity, while the 2005 season reflected reduced salmon opportunity. As work progressed on the model and the outlook for salmon opportunity in the near future appeared likely to be reduced from recent years it was decided to model estimated 2007-2008 impacts based solely on the 2005 season (reduced salmon opportunity). Groundfish directed effort has been shown to be affected by salmon opportunity (i.e. groundfish directed effort increases when salmon opportunity is poor due to anglers pursuing other species). Concern was expressed that adopting an overly optimistic groundfish season would result in inseason action to slow catch rates, and anglers would rather have regulations relaxed inseason rather than opportunities curtailed. If salmon opportunity improves in 2007-2008, the recreational groundfish opportunity could be expanded inseason.

Landings and discards for the shore and estuary fishery (in weight), largely not affected by management of overfished species, reflect the most recent 5-year average, 1998-2002 as the MRFSS program is designed for trends and not annual accurate estimates of catch. Only annual weights for greenling and cabezon were adjusted to reflect changes in minimum length requirements.

Normalizing 2005 Catch and Angler Trip Data

To facilitate providing maximum flexibility in modeling 2007-2008 management measure alternatives, landings in 2005 were normalized to a 10-fish marine bag limit and a year round season with no offshore closures.

From 2000 through 2002, the rockfish bag limit had been 10 fish per angler per day. Starting in 2003 a 10-fish marine bag limit was implemented that included species other than lingcod, salmon, steelhead, Pacific halibut, sanddab, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine and smelt. In response to an early closure in 2004, the 2005 marine bag limit started at 8 fish on January 1 and was reduced to 5 fish on July 16.

Normalization of the marine bag limit was accomplished by comparing the average catch per angler trip (CPUE) observed in 2005 (8 and 5 fish marine bag limits in place) with comparable periods in 2003-2004 (10 fish marine bag limit). The average reduction in CPUE observed by adjusting the marine bag limit from 10 to 8 fish was 10.9 percent. A 38.2 percent reduction was observed when the marine bag limit was adjusted from 10 to 5 fish. The same methodology was applied to discards per angler trip, as the number discarded for many species for which retention was allowed increased as the marine bag limit was reduced. Canary and yelloweye rockfish impacts were not adjusted, as the data suggested little change to the duration of groundfish trips, resulting in little savings of those two species.

Landings and discards were normalized to reflect a fishery without depth restrictions. In both 2004 and 2005, during the period from June through September the groundfish fishery was closed shoreward of the 40-fathom line. The expected increase in encounter rates for species residing offshore was based on data from 2001 and 2003-2005 at-sea observations on Oregon charter vessels (360 trips were observed). The observer study was not conducted in 2002. The following increased encounter rates were applied to appropriate months when normalizing to an all-depth fishery: canary rockfish = 1.32; yelloweye rockfish = 1.69; lingcod = 1.3; and widow rockfish = 3.57.

Landings and discards were normalized to a year round season. In both 2004 and 2005 regulations were changed inseason (starting in early September in 2004 and mid-October in 2005). Because of the inseason closures in 2004-2005, the 2003 fishery was used as a template for seasonal catch and effort pattern in the groundfish fishery as it was open January through December. Estimated catch for October through December was calculated by applying the monthly temporal pattern observed in 2003 to the normalized January through September 2005 estimates.

The expected average weight of landed fish was based on those observed in the 2005 ocean boat fishery. The expected average weight of discarded fish in the ocean boat fishery was based on at-sea observations in 2003-2005 with attention paid to matching samples with depth closure regulations. Observations indicate that yelloweye rockfish and canary rockfish caught shoreward of the 40 fm line were considerably smaller than the average size of those caught offshore, due to a higher abundance of juveniles nearshore. Due to small sample sizes observed at-sea, the average weight of fish landed in 2003 was used to represent the average weight of yelloweye rockfish caught during periods of no depth restrictions. For widow rockfish and nearshore rockfish other than black rockfish and blue rockfish, again due to small sample sizes (most are retained), a 25 percent reduction from average landed weight was assumed for discards of these species. This was thought to be conservative as the observed average size of discarded black rockfish and blue rockfish were on the order of a 50 percent reduction from average landed weight.

Annual groundfish directed angler effort for the ocean boat fishery is expected to be similar to levels observed in 2005. Effort data was also normalized using the 2003 temporal pattern to estimate groundfish effort during October through December when the nearshore fishery was closed in 2005. Angler effort in shore and estuary areas is assumed to be similar to the base period of 1998-2002. Groundfish angler trips in the shore and estuary fishery are not available, only total angler trips of all trips types. During closures seaward of 40-fm, ocean boat effort and catch were shifted from the offshore closure areas to open nearshore areas. The estimated effort increase in nearshore waters is 5 percent, which reflects the fact that approximately 5% of the total effort in 2001-2003 was in offshore waters. This effort shift was addressed when normalizing the 2005 fishery.

Estimating Discard Mortality in the Oregon Recreational Groundfish Fishery

An approach similar to that used for the commercial open-access nearshore fishery to determine mortality of discarded groundfish was used to develop appropriate discard mortality rates to be applied to the recreational fishery. The approach incorporates at-sea observations of catch by species, stratified by depth, with angler reported discard, and stratum based mortality rates by species.

At-sea observations were conducted on recreational charter vessels off Oregon during 2001, 2003-2005. A total of 360 vessels trips were conducted. Each year the observations were distributed across the state in an effort to represent the relative magnitude of catch by area. The annual goal was to conduct 100 observations, but that goal was not always achieved due to inseason closures. The number of rockfish observed by species or species group, discarded in the nearshore recreational fishery is reported in Table 4-34.

Table 4-34. Count of released fish observed by depth bin (fm) during 2001, and 2003-2005. Canary and yelloweye data from open all depth periods only; black, blue, and other nearshore rockfish data from all periods. Other nearshore rockfish includes brown, copper, quillback and china rockfishes (no discards of other nearshore rockfish species were observed).

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	> 40 fm	Sample Size

Black rockfish	296	372	18	2	0	0	688
Blue rockfish	183	622	48	5	0	0	858
Other nearshore rockfish	1	8	2	5	0	0	16
Canary rockfish	13	107	29	2	5	52	208
Yelloweye rockfish	0	5	1	1	0	13	20

The species of rockfish caught inside of 20-fm, and for which mortality rates are derived, include black, blue, other nearshore rockfish, canary, and yelloweye. The distribution of discarded fish by species and depth bin (fm) based on at-sea observations are identified in Tables 4-35a-e. Observed distributions are presented for all-depth fisheries, and predicted distributions are presented for fisheries closed seaward of 40-fm, 30-fm, 20-fm, and 10-fm.

Table 4-35a. Distribution of released fish observed by depth bin (fm) when open all depths.

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	> 40 fm	Sample Size
Black rockfish	43%	54%	3%	0%	0%	0%	688
Blue rockfish	21%	72%	6%	1%	0%	0%	858
Other nearshore rockfish	9%	73%	18%	45%	0%	0%	16
Canary rockfish	6%	51%	14%	1%	2%	25%	208
Yelloweye rockfish	0%	25%	5%	5%	0%	65%	20

Table 4-35b. Predicted distribution of released fish when closed outside 40 fm.

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	Sample Size
Black rockfish	43%	54%	3%	0%	0%	688
Blue rockfish	21%	72%	6%	1%	0%	858
Other nearshore rockfish	6%	50%	13%	31%	0%	16
Canary rockfish	8%	69%	19%	1%	3%	156
Yelloweye rockfish	0%	71%	14%	14%	0%	7

Table 4-35c. Predicted distribution of released fish when closed outside 30 fm.

Species	≤10 fm	11-20 fm	21-25 fm	26-30 fm	Sample Size
Black rockfish	43%	54%	3%	0%	688
Blue rockfish	21%	72%	6%	1%	858
Other nearshore rockfish	6%	50%	13%	31%	16
Canary rockfish	9%	71%	19%	1%	151
Yelloweye rockfish	0%	71%	14%	14%	7

Table 4-35d. Predicted distribution of released fish when closed outside 27 fm.

Species	≤10 fm	11-20 fm	21-25 fm	Sample Size
Black rockfish	43%	54%	3%	686
Blue rockfish	21%	73%	6%	853
Other nearshore rockfish	9%	73%	18%	11
Canary rockfish	9%	72%	19%	149
Yelloweye rockfish	0%	83%	17%	6

Table 4-35e. Predicted distribution of released fish when closed outside 20 fm.

Species	≤10 fm	11-20 fm	Sample Size

Black rockfish	44%	56%	668
Blue rockfish	23%	77%	805
Other nearshore rockfish	11%	89%	9
Canary rockfish	11%	89%	120
Yelloweye rockfish	0%	100%	5

Mortality rates for fish discarded by depth strata are detailed in Table 4-36. A mortality rate of 100% would be applied to all rockfish caught and discarded in waters deeper than 20-fm. These mortality rates were applied to the species distributions (Table 4-35) to determine the comprehensive mortality rates detailed in Table 4-37. These comprehensive mortality rates are applied to estimated discard, calculating estimated discard mortality.

Table 4-36. Mortality rates developed by the GMT for use in the Oregon recreational fishery.

Mortality rate	≤10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	> 40 fm
Black rockfish	10%	40%	100%	100%	100%	100%
Blue rockfish	10%	40%	100%	100%	100%	100%
Other nearshore rockfish	10%	50%	100%	100%	100%	100%
Canary rockfish	10%	50%	100%	100%	100%	100%
Yelloweye rockfish	10%	50%	100%	100%	100%	100%

Table 4-37. Recommended mortality rates for all-depth fisheries and fisheries closed outside of 40 fm, 30 fm, 25 fm, 20 fm and 10 fm.

Species	<=10 fm	<= 20 fm	<= 25 fm	<= 30 fm	<= 40 fm	All depth
Black rockfish	10%	27%	29%	29%	29%	29%
Blue rockfish	10%	33%	37%	37%	37%	37%
Other nearshore rockfish	10%	46%	55%	69%	69%	69%
Canary rockfish	10%	46%	56%	57%	58%	69%
Yelloweye rockfish	10%	50%	58%	64%	64%	88%

A 7 percent mortality rate is applied in the Oregon recreational groundfish fishery for discarded lingcod, cabezon, and greenling species. In addition, a 7 percent mortality rate is used for the shore and estuary boat fisheries for all species discarded because, as barotrauma is not an issue, mortality is mostly related to hook location.

Model Inputs

Daily bag limits, offshore closures, minimum length changes, effort increases, and abundance trends are the basic input factors applied to the standardized 2005 model.

Bag limits were modeled to range from 5 to 10 marine fish and 2 to 3 lingcod. The expected reduction in CPUE from reducing the marine bag limit from 10 fish is based on the same comparison used to normalize the 8 and 5 fish marine bag limits observed in the 2005 fishery. A linear relationship was assumed using the observations in going from 10 to 8 and 10 to 5 fish. The following rates (in percent) of decline in CPUE were used when reducing the bag from 10 fish: 9 = 5.5; 8 = 10.9; 7 = 20.0; 6 = 29.1; 5 = 38.2. As assumed in normalizing the model no effect on CPUE was expected for yelloweye rockfish and canary rockfish (no retention allowed).

The effect of increasing the lingcod bag limit from 2 to 3 fish was also analyzed. In the ocean boat fishery, sample data from 2005 was used to determine the proportion of anglers that had achieved their 2 fish bag limit in 2005 (6.3%). An increase of 10.6 percent of the estimated landings resulted, assuming the same anglers would achieve a 3 fish bag limit. Applying the same approach to discard data results in a reduction of the estimated discard of 15.6 percent. Similar adjustments were made to the estimated landings in the shore and estuary fisheries to reflect an increase in the bag limit (8.5 percent increase in landings). No reductions were made to the estimated discards in the shore and estuary fisheries as most anglers quit fishing when they achieve their lingcod bag limit. No adjustments were made for increased targeting due to the increased bag limit. Discussions with anglers and charter operators indicate any likely increase in targeting lingcod would occur in offshore areas, for which opportunity is drastically reduced due to offshore closures.

The effect of lingcod minimum length reductions from 24-inches to 22 and 20-inches were analyzed for both the ocean boat and shore and estuary fisheries. The length profile of discards was developed from at-sea observations in the 2005 ocean boat fishery. These were applied to the estimated proportion of fish discarded in 2005 (42 percent of total fish caught based on ORBS estimates). It was assumed that all fish between 20 to 24-inches, and 22 to 24-inches would have been retained under the respective regulations. This resulted in an estimated increase in number of fish retained under minimum length regulations of 20 and 22-inches of 53.6 and 35.8 percent respectively. The estimated decrease in the amount of discarded fish under minimum length regulations of 20 and 22-inches was 72.3 and 58.3 percent respectively. The profile of discarded fish in the ocean boat fishery was used as a proxy for the shore and estuary fishery, as there exists no profile of the length of fish discarded in that fishery. This data was applied to the estimated proportion of fish discarded in the shore and estuary fishery (78 percent of total fish caught based on MRFSS estimates). As in the ocean boat fishery it was assumed that all fish now of legal size would have been retained as very few anglers attain the 2-fish bag limit. Because modeling of the shore and estuary fishery is based on past landings in metric tons, no estimate of additional landings in number of fish was calculated, only an expected increase in metric tons. The increase in landings estimated under the 20 and 22-inch minimum length requirements is 10 mt (equating to a discard reduction of 10 mt) and 7 mt (equating to a discard reduction of 7 mt) respectively.

Expected encounter rate reductions by species normally encountered in offshore waters (widow rockfish, canary rockfish, yelloweye rockfish and lingcod) were developed for offshore closures outside of 40, 30, 25, and 20 fm. For retention species (widow rockfish and lingcod) these include expected reduction rates for landed fish (Table 4-38) and discarded fish (Table 4-39). For non-retention species (yelloweye rockfish and canary rockfish) these include expected reduction rates for both discarded and the few illegally retained fish (Table 4-40). They were based on the same at-sea observations mentioned earlier in the report. Offshore effort (5 percent of total groundfish directed effort) was assumed to move to open areas nearshore during offshore closure periods.

Table 4-38. Percent reductions in landed widow rockfish and lingcod due to depth closures.

2001, 2003-2005 count of landed fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0	1	9	3	54	174	241
Lingcod	115	320	77	16	6	161	695
2001, 2003-2005 distribution of landed fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0%	0%	4%	1%	23%	72%	100%
Lingcod	17%	46%	11%	2%	1%	23%	100%
Percent reduction in landed fish from open all depth to depth closure							
Species	Closed >10 fm	Closed >20 fm	Closed >25 fm	Closed >30 fm	Closed >40 fm		
Widow rockfish	100%	100%	96%	95%	72%		
Lingcod	83%	37%	26%	24%	23%		

Because smaller lingcod would be legal to retain under the proposed regulations reducing the minimum length to 22 and 20-inches, the average weight of both landed and discarded fish in the ocean boat fishery was also adjusted. The estimated number of fish at 22 and 20-inches that now would be landed was factored by the appropriate average weight (kg) resulting in a revised total metric tons landed. This new weight was divided by the estimated number of fish landed (landings in 2005 plus additional fish, reflecting the appropriate minimum length regulation) to determine a revised average weight. This resulted in a 13.3 percent reduction in average size under the 22-inch regulation and a 19.6 percent under the 20-inch regulation. This same process was used for the discarded fish resulting in a 59.1 percent reduction under the 22-inch regulation and a 78.7 percent reduction under the 20-inch regulation. There was no adjustment in the shore and estuary fishery as the number of fish and average weight are not part of the calculation of metric tons landed.

Table 4-39. Percent reductions in released widow rockfish and lingcod due to depth closures.

2001, 2003-2005 count of released fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0	2	0	0	3	0	5
Lingcod	269	633	110	36	13	46	1103
2001, 2003-2005 distribution of released fish by depth bin (fm), open all depths							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Widow rockfish	0%	40%	0%	0%	60%	0%	100%
Lingcod	24%	57%	10%	3%	1%	4%	100%
Percent reduction in released fish from open all depth to depth closure							
Species	Closed >10 fm	Closed >20 fm	Closed >25 fm	Closed >30 fm	Closed >40 fm		
Widow rockfish	100%	60%	60%	60%	0%		
Lingcod	76%	19%	9%	5%	4%		

Table 4-40. Percent total encounter reductions in yelloweye rockfish and canary rockfish due to depth closures.

2001, 2003-2005 count of total encounters (released + landed) by depth bin (fm), open all depth

Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Canary rockfish	33	244	65	25	20	120	507
Yelloweye rockfish	1	19	11	6	4	29	70
2001, 2003-2005 distribution of total encounters (released + landed) by depth bin (fm), open all depth							
Species	<=10 fm	11-20 fm	21-25 fm	26-30 fm	31-40 fm	>40 fm	Total
Canary rockfish	7%	48%	13%	5%	4%	24%	100%
Yelloweye rockfish	1%	27%	16%	9%	6%	41%	100%
Percent reduction in total encounters (released + landed) from open all depth to depth closure							
Species	Closed >10 fm	Closed >20 fm	Closed >25 fm	Closed >30 fm	Closed >40 fm		
Canary rockfish	93%	45%	33%	28%	24%		
Yelloweye rockfish	99%	71%	56%	47%	41%		

Abundance trends were only developed for lingcod. The average annual increase in impacts used was 1.17 percent and continues the same rate used for modeling the 2004-2006 fisheries. This increase was applied on a yearly basis. Thus for 2007 a 1.37 increase was used (2005 normalized catch x 1.17 x 1.17 representing increases from 2005 to 2006 and to 2007) and for 2008 a 1.6 increase was used (2005 normalized catch x 1.17 x 1.17 x 1.17).

Groundfish directed angler effort was assumed to remain equal to normalized 2005 under a 6 to 12 month season even during periods of offshore closures. For action alternative 1a, it was assumed that 33 percent of the angler effort from the closed period would shift to the open period resulting in 60 percent of annual effort (40 percent of annual effort normally occurs in the July through Labor Day period).

Angler effort in the directed Pacific halibut fishery was assumed to increase in 2007-2008 so as to harvest the complete halibut allocation. The halibut allocation was assumed to be equal to the 2006 allocation, which is four percent higher than in 2005. For action alternative 1b, having the lowest estimated yelloweye rockfish impact (1.5 mt), it was assumed that halibut effort and catch would be reduced by 30 percent.

Model Description

The model was divided into landed and discarded fish sections. Each section had similar components although the discarded section also had components to apply both mortality rates and changes in average size due to offshore closures. Groundfish impacts on yelloweye rockfish and canary rockfish in the Pacific halibut fishery were modeled separately.

The normalized 2005 impact model (all ocean boat fishery sources, excluding the targeted Pacific halibut fishery), include the following components for each species by month: (1) standardized catch; (2) bag limit affects; (3) offshore fishery effects on encounter rates; (4) 5 percent effort shifts to the nearshore fishery due to offshore closures; (5) average size; and (6) minimum length changes for lingcod. For landed and discarded fish the methodology to address the affects of various marine bag limits and offshore closures on (a) encounter rates and (b) shifting effort nearshore, were discussed earlier in the Normalization section. For landed and discarded lingcod, the methodology to address the affects of bag limits and changes in minimum length were discussed earlier in the Model Input section. Average weight was based on 2005 landed weight and at-sea observations for discarded fish as discussed earlier also in the Normalization section. Discarded fish mortality rates by rockfish species and depth were developed from at-sea observer data for catch distribution using mortality rates by species and depth.

Expected impacts on yelloweye rockfish and canary rockfish in the Pacific halibut fishery were addressed separately. The 2005 encounter rate per halibut pound landed, and the 2002-2003 average weight of fish caught shoreward of 30-fm, was applied to the 2006 Oregon central coast all-depth halibut sport allocation to address expected impacts on both species. This assumes similar Pacific halibut allocations in 2007-2008.

Landings and discard impacts for shore and estuary caught species were modeled on a season total basis using the 1998-2002 average impacts (mt). This fishery will be managed for a year round season as it does not impact yelloweye rockfish and canary rockfish. The impacts were adjusted to reflect length limits applied to cabezon and greenling since that period. Sublegal cabezon and greenling that were landed in the 1998-2002 period were now considered discards. A mortality rate of 7 percent was applied to all species discarded in the shore and estuary fishery to represent hooking mortality as the waters are not deep enough to cause mortality from barotrauma.

4.5.1.8 Modeling California Recreational Impacts

The CDFG revised their impact projection model that was reviewed by the GMT at their February 2006 meeting. The GMT recommends this updated model for use in projecting impacts of groundfish species in 2007-2008 California recreational fisheries. This model is described below and is used in impact analyses in this EIS.

Introduction

Recreational fisheries management for multispecies assemblages in California presents many challenges. In recent years, declining stocks of several rockfish species have dictated recreational groundfish management seasons and depths in California. Increasingly complex restrictions have been necessary to provide fishing opportunities that keep total catch of overfished species within the reduced limits that are necessary to rebuild the stocks.

Prior to 2000, the recreational daily bag limit for rockfish was 15 fish per angler and there were no closed months or depths. Beginning in 2000, the daily bag limit was reduced to 10 fish. Regulations have changed each year since 2000, making analysis of the effect of particular regulations difficult to determine. In addition, regulations have become more region-specific, adding to the difficulty of modeling projected catches.

Methodology Used to Project Recreational Catches for 2007-2008

Background

The recreational catch model incorporates a number of parameters and assumptions, all of which are either risk-neutral or risk-adverse. The basic analytical approach is the same as that used for 2005-2006, with new data from the California Recreational Fishery Survey (CRFS) program to serve as a baseline. Model output predicts expected catch under any combination of season and depth fishing restrictions by region.

Management Region Definitions:

North Region:	North of 40°10' N latitude to CA/OR border
North-Central Region:	South of 40°10' N latitude to 37°11' N latitude (Pigeon Pt.)

South-Central Monterey Region:	South of Pigeon Pt. to 36° N latitude (Lopez Pt.)
South-Central Morro Bay Region:	South of Lopez Pt. to 34°27' N latitude (Pt. Conception)
South Region:	South of Pt. Conception to CA/Mexico Border

CDFG/California Recreational Groundfish Model Assumptions

Effort Shift Inshore: The model includes a 27.6% increase in expected landings when fishing is restricted to less than 30 fm and a 39.3% increase in expected landings when fishing is restricted to less than 20 fm. The increase, or effort shift, is to account for increased effort in a smaller fishing area.

Discard Mortality: 1) Canary, cowcod, and yelloweye are non-retention species which have high mortality rates when caught and released. Therefore, expected mortality estimates for these species also include B2 fish (fish reported to be released live) with hooking mortality rates as follows:
10.5 % for the depth range 0-10 fm; 42% for 10-20 fm; and 100% for depths greater than 20 fm.
2) CA Scorpionfish hooking mortality rate is assumed to be 5%. This rate is applied to expected landings of CA Scorpionfish when fishing is allowed for species which associate with CA scorpionfish, but fishing for CA Scorpionfish is not allowed.

Inputs and Key Parameters for the Model

Weighting of Base Years: Base year catches from 2004 and 2005 are combined together in this version of the model using a 0.67 decay function (which translates into a weighting of 60% for 2005 and 40% for 2004). Model output predicts expected catch under any combination of season and depth fishing restrictions by region. *Reasons for weighting the 2005 estimates more heavily than the 2004 estimates include:* the recognition that constraints placed on salmon fishing in 2005 will likely persist over the next several years; and the acknowledgement that the expanded distribution and greater abundance of blue rockfish (as well as other groundfish species) due to cooler oceanographic conditions will also likely persist into 2007 and 2008. *Reasons for using 2004 data include:* the recognition that oceanographic conditions in 2005 were unusual while conditions in 2004 are more in line with what might be expected in 2007-2008 under a colder water regime; and the expectation that the bulk of blue rockfish take (and potentially brown and olive rockfish take) will occur within deeper nearshore waters as was observed in 2004 rather than in the shallow nearshore waters as in 2005.

Base Year Catch: Initially, CRFS catch estimates in WEIGHT of fish were summed for caught and retained (CRFS “A” catch), filleted/caught and released dead (CRFS “B1” catch), and for species of concern, a proportion of CRFS “B2” catch (released alive) derived using depth-based mortality estimates. Base year catch estimates are assumed to be for an unrestricted fishing year with no months closed and no depths closed. Therefore, for each year, a back calculation method was used to add a catch estimate for what the catch would have been if all months and all depths had been open. This back calculation uses percent catch by month and depth derived from historical catch estimates.

Historical Catch By Month: Estimates of historical percent catch by two-month period were calculated for each region based on RecFIN Marine Recreational Fisheries Statistics Survey (MRFSS) data (weight of A+B1) from 1993-1999, which was a time period when seasons and depths were unconstrained. Proxies were considered on a species by species basis for regions where there was a lack of catch data for that area. Monthly estimates of percent catch then were divided equally (50:50) for each pair of months.

Historical Catch By Depth: Estimates of percent catch by depth were calculated for each region based on RecFIN MRFSS depth sample data (numbers caught A+B1 for CPFV and A+B1+B2 for PR) from 1999-2000, which was a time period when depths were unconstrained. Proxies were considered on a species by species basis for regions where there was a lack of catch data for that area.

Methodology used to Calculate Annual Unrestricted Catch

1. Pull (A + B1) Catch for each year from the RecFIN CRFS data web site: http://www.psmfc.org/recfin/forms/est2004.html.
   Specify species, and select the parameters: month and district under Define Table Layout.
2. Pull historical catch by depth (1999-2000, most recent years unregulated by depth) from the RecFIN boatdepth2 site:
   http://www.psmfc.org/recfin/forms/boatdepth2.html
   Add PC and PR fish caught together for each separate region and species, maintaining combined depth totals for each depth strata. Calculate average percentage of total fish caught within each 10 fm depth stratum (= "Depth Profile") by dividing 10 fm depth strata totals by combined total sum of all strata for the region. Assign proxies as needed for data-poor areas, using adjacent regions, similar species, etc.
3. Pull historical catch through time (1993-1999, the most recent years unregulated by monthly closure) from RecFIN web site:
   http://www.psmfc.org/recfin/forms/est.html
   Calculate average wave %'s over combined years 1993-1999 by dividing individual wave totals by sum of all waves for each region. Assign proxies as needed for data-poor areas using the other region (North or South) as the proxy.
4. For each management region and species, calculate total regulated catch based on months each set of regulations was in effect. For example, if fishing was only open from 0-60 fm for March-December, sum total catch for those months only. If using B2 (reported catch released live) mortality, add calculated B2 mortality to these catch totals. Each management region should now have catch data for all species grouped by the different sets of management regulations (MR sets) in effect for the year so that the identical calculations can easily be performed on identically restricted species.
5. **Expanding to All Depths**. For each MR set: If there was **no** depth restriction, use the unmodified total regulated catch as the expected catch for all depths for that period of the year. If a depth restriction was in place, use total regulated catch to expand out each species in each MR set to all depths: from the Depth Profile, divide total regulated catch by sum of proportion of catch represented by the depths where fishing was open. This is the total expected catch for all depths. For example, if fishing for a MR set was open < 20 fm, divide the total catch by the percentage of the catch < 20 fm using the appropriate Depth Profile (historical unregulated catch data) for each species and region.
6. **Effort Shift**. If the depth restriction is confined to a 20 or 30 fm band, we assume increased effort occurred for these months. To remove this effect, apply an Effort Shift factor to remove the increased fishing (and increased catch) for the constrained depth zone. For example, if a 0-20 fm restriction was in effect, divide the total expected catch for all depths by 1.393 to get final total expected catch for those months. Similarly, use a factor of 1.276 if fishing was restricted within a 30 fm range. No Effort Shift is applied for depth restrictions > 30 fm.
7. **Accounting for Closed Months**. After expanding to all depths and removing Effort Shift (if needed), sum all the final expected catch values across all the MR sets for the year for each management region and species. Divide this sum by the % catch for the year that these regulated months represent (from the wave %'s for the year). In other words, divide the

calculated catch for all open months by the percentage of the catch for the year these months historically represent. This results in the expected annual unregulated catch, expanded out from the regulated catch, for each region and species.

8. Input expected annual unregulated catch for each region-species into the Catch by Year Table in the RecFIN Model database. The weighting of the different years' data to be used by the model in projecting catch can be selected at the model-user interface.

Estimates of Total Mortality for Canary and Yelloweye Rockfish Using Two Different Methods for Estimating Discarded Catch

The California recreational catch projection model accounts for total mortality by combining A (sampler examined), B1 (discarded dead/filleted) and a portion of B2 (discarded alive) catch. To calculate the portion of B2 to include in the total mortality estimate, California staff apply mortality rates to the B2 catch component in the following manner: 10.5% for fish caught between 0-10 fm, 42% for fish caught between 10-20 fm, and 100% mortality for all other depths. Oregon and Washington account for total mortality by combining A (sampler examined) and a portion of a combined B catch (catch discarded dead or alive, or catch otherwise unavailable to be examined). Staff from these states apply a 50% mortality rate to the B catch component for fish caught between 0-20 fm and 100% mortality to the B fish caught at all other depths.

To determine which of these methods was more conservative in estimating total mortality, a comparison of the methods was made for canary and yelloweye rockfish taken by California anglers statewide using 2004 and 2005 CRFS A, B1, and B2 annual catch estimates. For this comparison, the type B and B1 fish included catch used as bait, given to other anglers, or otherwise not available for examination.

The total mortality estimates calculated by these two different methods are provided in Table 4-41.

Table 4-41. Total Mortality Estimates (mt) Calculated from Two Different Methods Using 2004 and 2005 California Recreational Fisheries Survey A, B1, and B2 Annual Catch Estimates.

Species	Year	Total Mortality (mt)	
		Combined B[a/] Method	B1 & B2[b/] Method
Canary	2004	NA	NA
	2005	6.8	7.1
Yelloweye	2004	2.7	3
	2005	5.1	5.6

a/ Mortality estimate includes A catch + mortality rates applied to discarded catch combined together (Combined B).

b/ Mortality estimate includes A catch + B1 catch + mortality rates applied to B2 catch (discarded catch (B1 &B2) treated separately).

The "Combined B" method consistently results in lower total mortality catch estimates; that is, it results in lower discard mortality than the "B1 & B2" method. Thus, the California recreational catch projection model uses a more conservative estimate for discard mortality, leading to a higher estimate of overall mortality. However, more analyses may be needed after the PFMC RecFIN Workshop in

August, when further discussions will be held on what constitutes the discard catch (type “B”) for Washington, Oregon, and California.

Estimation of Impacts

The CDFG is proposing the seasons described under Action Alternatives 1-3 in Chapter 2. The estimated impacts to select groundfish species in 2007 and 2008 California recreational fisheries by region are described in section 4.5.4.

Action Alternative 3 includes an increase in the greenling bag limit from one to two fish. CDFG used the RECFIN methodology for Hypothetical Bag Limit Analyses available at http://www.psmfc.org/recfin/forms/bfreq.html to determine increased impacts on greenlings resulting from this change. The program uses the A+B1+B2 fish from 2004 for estimating the increased impact based on all fish encountered. The A fish are sampled dead fish. CDFG assumes for greenling that B1 includes filets and there were no fish thrown back dead as kelp greenling usually survive release. B2 includes live fish over the bag limit or under the size limit of 12". Since there is no way to estimate the proportion of fish that were undersized, this analysis also assumes there were no fish thrown back as sublegal and assumes that all B2 fish would be available if the bag limit were increased as the most conservative estimate. All bags over the hypothetical limit are then set to the hypothetical limit to calculate increased take. The increased estimated impact on greenlings would be 15% based on this analysis. Even with the increase in catch, landings are expected to stay within the CDFG recreational allocation as greenling landings in 2005 were 37% of the allocation.

Action Alternative 1 includes a reduction in the bocaccio bag limit from Cape Mendocino to the Oregon border from 2 to 1 fish to protect bocaccio under the lower OY. The estimated saving in bocaccio as a result of this change is not possible to determine because the data cannot be summarized for only this region. Bocaccio is at the northern end of its distribution in this part of the state and the fishing effort is low relative to other regions. The estimated take of bocaccio in 2005 was minimal in this region, therefore some small but undetermined amount of savings would be expected. Action Alternative 3 includes an increase in the bocaccio bag limit from one to two fish for the area south of Cape Mendocino so that the statewide bag limit would be two fish. CDFG used the RECFIN methodology for Hypothetical Bag Limit Analyses available at http://www.psmfc.org/recfin/forms/bfreq.html to determine increased impacts on bocaccio resulting from this change. The program uses the A+B1 fish from 2004 and 2005 for estimating the increased impact. The A fish are sampled dead fish. CDFG assumes for bocaccio that B1 includes filets and fish thrown back dead (over the bag limit) as bocaccio do not usually survive release. There is no way to estimate the proportion of B2 fish that were undersized or the proportion thrown back alive. Therefore, B2 fish were not included as CDFG assumed most of the B2 fish were sublegal and there would be very few legal fish released alive. All bags over the hypothetical limit are then set to the hypothetical limit to calculate increased take. The increased estimated impact on bocaccio would be 27% based on this analysis. Landings are still expected to stay within the CDFG recreational allocation as bocaccio landings in 2005 were 64% of the allocation.

There have been anecdotal suggestions that there has been good bocaccio recruitment in southern California during 2003 and/or 2004. Those fish would be expected to recruit first to the recreational fishery in 2006 or 2007, so that additional unknown and unquantified impacts from new recruits could also occur, however, CDFG reviewed the 2005 and 2006 CRFS sample data to look for a spike in small fish with no success.

Action Alternative 1 includes a reduction in the lingcod bag and size limit from the No Action

Alternative of two fish at 24” to one fish at 22” to reduce fishing effort for lingcod, thereby reducing impacts on associated rebuilding species. The estimated increase in lingcod take as a result of reducing the size limit from 24” to 22” would be 26% using the formula:
Total Catch from 24" /(1 - 0.207) = Adjusted Catch

Reducing the bag limit from two to one fish at 22” would reduce this estimated increase by 27% based on the formula:
Adjusted Catch x (1 - 0.27) = Estimated Catch under a one fish bag limit.

Using the Total Catch estimate (300 mt) from 2005, the overall reduction in catch would be 24 mt or eight percent. Data from 1995 – 1997 were used to estimate size reduction increases and bag limit decreases when a 22” size limit was in effect.

Lingcod Bag and Minimum Size

CDFG is continuing to propose alternatives to fishery closure as an inseason management response to projected over harvest of lingcod if it occurs. If the CDFG determines that more restrictive management measures are necessary to slow the harvest of lingcod, an increase in the minimum size limit, or a reduction in the bag limit from two to one, may be implemented. Projected harvest for each upcoming month may be multiplied according to the coefficients for size and/or bag limit to identify the management response necessary to keep projected catch within the recreational harvest guideline.

Coefficients to modify projected catch of lingcod from a two-fish bag limit to a one-fish bag limit, or from 24” to a smaller or larger minimum size are shown in Table 4-42.

Table 4-42. Coefficients used to model lingcod bag and size limits in the California recreational groundfish fishery.

Size Limit (inches)	Size Coefficient	Bag Limit Coefficient
22	0.207	0.27
24 (status quo)	0	0.214
25	0.169	0.18
26	0.304	0.15
27	0.43	0.12
28	0.521	0.1
29	0.581	0.07
30	0.641	0.039
31	0.685	0.025
32	0.723	0.011

4.5.2 Allocating Depleted Species’ Impacts

The three action alternatives discussed in sections 2.2.3.2 - 2.2.3.4 indicate ways in which the allowable impacts to depleted species may be divided between sectors. Under increasingly low OYs, such ad hoc allocations become even more critical, as the values selected may significantly constrain fisheries’ access to healthy stocks and target OYs. In order to explore hypothetical allocation scenarios under the high and low OYs, the Council requested that the GMT produce a number of tables (called “bycatch scorecards”) in which depleted species impacts are attributed to sectors following different allocation strategies. Each of these eight scorecards is discussed below, in addition to the assumptions and methodology employed to construct them.

Past relationships between sectors (i.e., their relative contribution toward the total mortality impact for a particular species) provide instructive templates for these hypothetical allocation scenarios. Therefore, at the Council's request, the scorecard of final 2005 mortality estimates and the scorecard projecting impacts in 2006 were used as the starting points from which to explore allocation options. As explained in the description of the No Action Alternative (section 2.2.3.1), factors such as the behavior of fishery participants and natural conditions caused certain sectors to exceed their expected harvest, while other sectors accounted for less mortality than had been originally estimated. For example, in 2005 the Washington and Oregon recreational fisheries exceeded their harvest guideline for yelloweye rockfish. These kinds of situations are captured in the 2005 scorecard, so that the relationships between sectors reflect what actually happened (rather than what was anticipated); this suggests that such proportions may be highly dependent on the particular circumstances that occurred in 2005 and so may not apply accurately to future conditions. The relationships between sectors within the 2006 scorecard represent those initially intended by the Council from the 2005-2006 harvest specifications process (in addition adjustments made to correct problems, such as those encountered in 2005); however these projections contain uncertainty as to how well management measures will operate to correctly constrain the fisheries.

In constructing these scorecards, numerous assumptions were made, following Council guidance. First, it was assumed that the impacts associated with the incidental groundfish open access sector and the tribal sector would not change under the Council's action, as these sectors are managed through separate regulations. The impacts associated with research were maintained at status quo, or in the cases of bocaccio, widow rockfish, and yelloweye rockfish, the anticipated research take was increased to provide for additional studies on depleted and co-occurring species. The low yelloweye rockfish OY scenario, however, does not accommodate this increase in the amount reserved for research. The impacts associated with these three sources were therefore held constant across all of the scorecards.

4.5.2.1 High OY Alternatives

For most species, the impact estimates attributed to each sector in 2005 and in 2006 can be directly applied to the high OY alternatives (Table 4-43 and Table 4-44, respectively). For example, limited entry bottom trawl accounted for 46.6 mt of bocaccio mortality in 2005; 46.6 mt of bocaccio mortality can still be accommodated under the 2007-2008 high OY alternative of 218 mt. Continuing with the example of bocaccio, the 2005-2006 OY is nearly 100 mt greater than the high OY alternative for that stock. However the total estimated catch in 2005 was far less than the OY, which resulted in a large residual amount; by carrying over the same mortality estimates for the sectors, the 2007-2008 high OY alternatives can also provide for a residual to buffer against uncertainty, but it is a smaller value. Although this situation holds true for most of the depleted species, there are two exceptions. For the canary rockfish OY alternative, the impact estimates in both 2005 and 2006 are greater than what can be accommodated under the canary rockfish high OY alternative of 44 mt. Therefore, following Council guidance, each sector's canary rockfish impact was reduced proportionately in order to create a 0.5 mt set-aside. Similarly, the 2008 yelloweye rockfish OY alternative (20 mt) is too small to maintain past mortality impacts; to resolve this, the necessary proportional reductions were made to each sector's impacts, however no set-aside was created.

Table 4-43. 2007-2008 estimated total mortality: High OY applied to the status quo 2006 scorecard.

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Y'eye 2007	Y'eye 2008
Limited Entry Trawl- Non-whiting	47.4	7.5	2.7	160.3	63.3	1.0	0.3	0.3
Limited Entry Trawl- Whiting								
At-sea whiting motherships		4.5		4.7	1.0	200.0	0.0	0.0
At-sea whiting cat-proc				6.3	2.9		0.0	0.0
Shoreside whiting				5.2	1.8		0.0	0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0	0.0
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0	0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9	2.4
Open Access: Directed Groundfish	10.6	2.9	0.1	0.2	0.1	0.1	3.0	2.5
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)								
Recreational Groundfish								
WA		1.6					3.5	3.0
OR		6.6				1.4	3.2	2.7
CA	98.0	9.0	0.4			8.0	3.7	3.1
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	3.0
Non-EFP Total	173.7	43.5	3.4	181.9	77.4	260.4	22.6	20
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	173.7	43.5	3.4	181.9	77.4	260.4	22.6	20.0
2007-2008 High OY Alt.	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	**20**
Difference	44.3	0.5	4.6	47.2	22.6	107.6	0.4	0.0
Percent of OY	79.7%	98.8%	42.5%	79.4 %	77.4 %	70.8%	98.1%	99.8%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.
b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-44. 2007 estimated total mortality: High OY applied to the 2005 scorecard.

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Y'eye 2007	Y'eye 2008
Limited Entry Trawl- Non-whiting	46.6	9.5	2.7	135.9	61.0	1.0	0.4	0.3
Limited Entry Trawl- Whiting								
At-sea whiting motherships							0.0	0.0
At-sea whiting cat-proc		3.3		16.4	2.1	155.8	0.0	0.0
Shoreside whiting							0.0	0.0
Tribal whiting		0.6		0.0	0.6	6.1	0.0	0.0
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0	0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9	2.5
Open Access: Directed Groundfish	10.6	3.0	0.1	0.2	0.1	0.1	3.0	2.5
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet b/	0.5			0.0	0.0	0.0		
CA Sheephead b/				0.0	0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3							
CPS- squid c/								
Dungeness crab b/	0.0		0.0	0.0	0.0			
HMS b/		0.0	0.0	0.0				
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)								
Recreational Groundfish								
WA		1.4					5.4	4.4
OR		5.4				1.6	4.2	3.5
CA	37.3	2.0	0.4			1.6	0.9	0.8
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	3.0
Non-EFP Total	112.2	35.0	3.4	157.7	71.5	210.0	22.8	20.0
EFPs d/								
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	112.2	35.0	3.4	157.7	71.5	210.0	22.8	20.0
2007-2008 High OY Alt.	**218**	**44.0**	**8.0**	**229**	**100**	**368**	**23**	**20**
Difference	105.8	9.0	4.6	71.4	28.5	158.0	0.2	0.0
Percent of OY	51.5%	79.7%	42.5%	68.8 %	71.5 %	57.1%	99.0%	99.8%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.						

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

4.5.2.2 Low OY alternatives

In order to constrain fisheries below the OYs under the low alternatives, Action Alternative 1 management measures are more stringent than those under status quo (Action Alternative 1 is explained in section 2.2.3.2).

As was done for the high OY alternatives, scorecards were produced in which the 2005 and 2006 mortality impact estimates were reduced proportionately in order to be constrained to the low OY alternatives (Table 4-45 and Table 4-46, respectively). With the exception of cowcod, there are no residuals associated with any of the species; setting aside a portion of the OY to buffer against uncertainty would create even more extreme effects for sectors than those already anticipated under full utilization of the OYs (see chapter 7 for further discussion of the socio-economic impacts of a suite of low OYs).

Table 4-45. 2007-2008 estimated total mortality: Low OY applied to the status quo 2006 scorecard (each sector's projected impact is reduced proportionately).

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	10.0	4.9	2.7	113.7	32.9	0.3	0.1
Limited Entry Trawl- Whiting							
At-sea whiting motherships				3.3	0.5		
At-sea whiting cat-proc		3.0		4.5	1.5	66.9	
Shoreside whiting				3.7	0.9		
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	2.8	0.8	0.1	0.9	0.2	0.2	1.3
Open Access: Directed Groundfish	2.2	1.9	0.1	0.1	0.1	0.0	1.4
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		1.1					1.6
OR		4.3				0.5	1.5
CA	20.7	5.9	0.4			2.7	1.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	3.4	130.0	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	3.4	130.0	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32.0**	**4.0**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	85.9%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-46. 2007-2008 estimated total mortality: Low OY, applied to the 2005 scorecard (each sector's estimated impact is reduced proportionately).

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	15.4	8.0	2.7	111.5	34.6	0.4	0.2
Limited Entry Trawl- Whiting							
At-sea whiting motherships							
At-sea whiting cat-proc		2.8		13.5	1.2	68.5	
Shoreside whiting							
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	4.4	1.0	0.1	1.1	0.2	0.2	1.3
Open Access: Directed Groundfish	3.5	2.5	0.1	0.2	0.1	0.0	1.4
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		1.6					2.4
OR		4.1				0.7	1.9
CA	12.3	1.7	0.4			0.7	0.4
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	3.4	130.1	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	3.4	130.1	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32.0**	**4.0**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.6	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	85.9%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Employing proportional reductions to constrain to the low OYs, as described above, continues status quo Council policy to provide fishing opportunities across regions and sectors; this is consistent with guidance in the Groundfish FMP that "overfishing restrictions and recovery benefits should be fairly and equitably allocated among sectors of the fishery" {PFMC 2004}. However, there are numerous other allocation strategies that could be adopted (through revision of the Groundfish FMP), depending on the management objective sought by the Council; under the constraints of low OYs, such as those within these alternatives, these strategies may provide for a more viable fishery at a coastwide level. Other sections in this EIS also discuss allocation strategies, each of which is based on alternative management objectives. In chapter 7, for example, it is noted that under a highly constrained fishery, allocation could optimize coastwide revenue by allowing mortality impacts only for fisheries that account for the greatest amount of ex vessel revenue, eliminating the fisheries that account for the lowest ex vessel revenue. In this section, another scenario is depicted, in accordance with Council guidance: all of the mortality impacts are associated with either the recreational sector (Tables 4-47 and 4-48) or the commercial sector and (Tables 4-49 and 4-50). These are extreme scenarios that depict a situation that the Council might consider under OYs so constraining that all sectors operating under status quo could not be maintained.

Like the scorecards discussed above, those representing the "all recreational" and "all commercial" scenarios are based on the 2005 scorecard and the 2006 scorecard. That is, for example, the relationships between the commercial sectors are maintained at 2005 proportions (Table 4-50), while zero mortality impacts are estimated for the three recreational groundfish fisheries. Under the "all recreational" scenarios (Tables 4-47 and 4-48) however, the Council provided guidance that commercial fisheries should be constructed using OYs of the species for which there is no recreational fishery mortality. As such, POP and darkblotched rockfish were divided between the LE bottom trawl and whiting sectors using 2005 or 2006 scorecard proportions, as these two sectors are judged to be the only commercial fisheries that can be executed without mortality of other depleted species.

Table 4-47. 2007-2008 estimated total mortality: Low OY, applied to the status quo 2006 scorecard (all relevant projected impacts allocated to the recreational fishery).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting				112.7	32.7		
Limited Entry Trawl- Whiting							
At-sea whiting motherships				3.3	0.5		
At-sea whiting cat-proc				4.4	1.5		
Shoreside whiting				3.7	0.9		
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear							
Open Access: Directed Groundfish							
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		2.1					2.6
OR		8.3				10.5	2.3
CA	**35.7**	11.4	3.9			60.1	2.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	128.0	43.5	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	128.0	43.5	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	2.0	0.5	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	98.5%	98.9%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-48. 2007-2008 estimated total mortality: Low OY applied to the 2005 scorecard (all relevant estimated impacts allocated to the recreational fishery).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting				110.5	34.3		
Limited Entry Trawl- Whiting							
At-sea whiting motherships							
At-sea whiting cat-proc				13.3	1.2		
Shoreside whiting							
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	**3.7**	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear							
Open Access: Directed Groundfish							
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA		4.7					3.9
OR		12.1				35.3	3.1
CA	**35.7**	5.0	3.9			35.3	0.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	127.7	43.5	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	127.7	43.5	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	2.3	0.5	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	98.2%	98.8%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-49. 2007-2008 estimated total mortality: Low OY applied to the status quo 2006 scorecard (all relevant projected impacts allocated to the commercial fishery).

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	23.7	10.2	3.6	113.7	32.9	0.3	0.4
Limited Entry Trawl- Whiting							
At-sea whiting motherships				3.3	0.5		
At-sea whiting cat-proc		6.1		4.5	1.5	70.1	
Shoreside whiting				3.7	0.9		
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	6.7	1.6	0.1	0.9	0.2	0.2	3.6
Open Access: Directed Groundfish	5.3	3.9	0.1	0.1	0.1	0.0	3.7
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA							
OR							
CA							
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	130.0	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	130.0	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).

d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Table 4-50. 2007-2008 estimated total mortality: Low OY applied to the 2005 scorecard (all relevant estimated impacts allocated to the commercial fishery).

Fishery	Bocaccio *a/*	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	23.6	12.2	3.6	111.5	34.6	0.4	0.5
Limited Entry Trawl- Whiting							
At-sea whiting motherships							
At-sea whiting cat-proc		4.2		13.5	1.2	69.9	
Shoreside whiting							
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	3.7	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	6.8	1.5	0.1	1.1	0.2	0.2	3.5
Open Access: Directed Groundfish	5.4	3.8	0.1	0.2	0.1	0.0	3.6
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish							
WA							
OR							
CA							
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	3.0	3.0	0.1	3.8	3.6	3.0	2.0
Non-EFP Total	40.0	32.0	4.0	130.1	44.0	120.1	12.6
EFPs d/							
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	40.0	32.0	4.0	130.1	44.0	120.1	12.6
2007-2008 Low OY Alt.	**40**	**32**	**4**	**130**	**44**	**120**	**12.6**
Difference	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Percent of OY	100.0%	99.9%	100.0%	100.0%	100.1%	100.0%	99.7%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in available data sources.					

a/ South of 40°10' N. lat.
b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.
c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch).
d/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

4.5.2.3 Comparing Allocation Scorecards with Action Alternatives

Management measures alternatives are developed based on the specific conditions of each fishery, such as what tools are available to managers and how the fishery is constrained by other depleted species; the relationships between sectors' mortality impacts estimates are not necessarily held constant from year to year. Similarly, the Action Alternatives detailed in Chapter 2 result in impact estimates that create different relationships between sectors than those that occurred in 2005 and projected for 2006 (Table 4-51). For example, the 2006 scorecard projects that canary rockfish mortality impacts will be shared between commercial and recreational sectors at a ratio approximating 48:52, while under Action Alternative 2, this relationship changes to approximately 59:41. These kinds of changes in proportions are also present within the commercial sector and within the recreational sector. For example, while the California recreational fishery accounts for approximately 52% of the total recreational impacts in 2006, under Action Alternative 2 the fishery's impacts are projected to account for 68%.

Table 4-51. Percent of impact by sector as a proportion of total impact (2005 and 2006).

		Boc	Can	Cow	Dkbl	POP	Wid	Yeye
2006 (status quo)	**% Commercial impact**	**42.1%**	**48.4%**	**87.9%**	**100.0%**	**100.0%**	**95.5%**	**37.3%**
	% Recreational impact	**57.9%**	**51.6%**	**12.1%**	**0.0%**	**0.0%**	**4.5%**	**62.7%**
2005	% Commercial impact	65.4%	65.9%	87.9%	100.0%	100.0%	98.0%	38.2%
	% Recreational impact	34.6%	34.1%	12.1%	0.0%	0.0%	2.0%	61.8%
Action Alt. 1	% Commercial impact	53.8%	52.2%	100.0%	100.0%	100.0%	97.5%	26.9%
	% Recreational impact	46.2%	47.8%	0.0%	0.0%	0.0%	2.5%	73.1%
Action Alt. 2	% Commercial impact	70.2%	59.4%	96.9%	100.0%	100.0%	96.5%	37.3%
	% Recreational impact	29.8%	40.6%	3.1%	0.0%	0.0%	3.5%	62.7%
Action Alt. 3	% Commercial impact	41.1%	54.9%	91.2%	100.0%	100.0%	86.7%	41.2%
	% Recreational impact	58.9%	45.1%	8.8%	0.0%	0.0%	13.3%	58.8%
2006 (Status quo)	**Commercial Groundfish impacts**							
	LE Trawl- Non-whiting	**66.4%**	**46.7%**	**93.1%**	**90.1%**	**91.1%**	**0.5%**	**4.8%**
	LE Trawl- Whiting		**28.1%**		**9.1%**	**8.1%**	**99.2%**	
	LE Fixed Gear	**18.8%**	**7.2%**	**3.4%**	**0.7%**	**0.6%**	**0.2%**	**46.8%**
	OA: Directed Groundfish	**14.8%**	**18.0%**	**3.4%**	**0.1%**	**0.1%**	**0.0%**	**48.4%**
	Recreational Groundfish impacts							
	WA		**9.6%**					**33.7%**
	OR		**38.2%**				**14.9%**	**30.8%**
	CA	**100.0%**	**52.2%**	**100.0%**			**85.1%**	**35.6%**
2005	Commercial Groundfish impacts							
	LE Trawl- Non-whiting	66.0%	55.9%	93.1%	88.4%	95.9%	0.6%	6.3%
	LE Trawl- Whiting		19.4%	0.0%	10.7%	3.3%	99.0%	
	LE Fixed Gear	19.0%	7.1%	3.4%	0.8%	0.6%	0.3%	46.0%
	OA: Directed Groundfish	15.0%	17.6%	3.4%	0.1%	0.2%	0.1%	47.6%
	Recreational Groundfish impacts							
	WA		21.6%					51.0%
	OR		55.7%				50.0%	40.2%
	CA	100.0%	22.7%	100.0%			50.0%	8.8%
Action Alt. 1	Commercial Groundfish impacts							
	LE Trawl- Non-whiting	48.9%	47.9%	50.0%	86.7%	89.8%	0.2%	6.3%
	LE Trawl- Whiting		37.5%	0.0%	11.2%	8.3%	98.9%	
	LE Fixed Gear	29.0%	1.7%	25.0%	1.8%	1.7%	0.8%	37.5%
	OA: Directed Groundfish	22.0%	12.9%	25.0%	0.3%	0.3%	0.2%	56.3%
	Recreational Groundfish impacts							
	WA		9.7%					35.5%
	OR		22.6%				5.9%	36.9%
	CA	100.0%	67.7%	0.0%			94.1%	27.6%
Action Alt. 2	Commercial Groundfish impacts							

	LE Trawl- Non-whiting	67.8%	55.1%	93.5%	93.2%	94.5%	1.1%	6.5%
	LE Trawl- Whiting		29.4%	0.0%	6.1%	4.6%	98.2%	
	LE Fixed Gear	18.0%	3.7%	3.2%	0.6%	0.8%	0.6%	45.2%
	OA: Directed Groundfish	14.2%	11.8%	3.2%	0.1%	0.1%	0.1%	48.4%
	Recreational Groundfish impacts							
	WA		8.6%					34.6%
	OR		28.0%				3.0%	36.5%
	CA	100.0%	63.4%	100.0%			97.0%	28.8%
	Commercial Groundfish impacts							
	LE Trawl- Non-whiting	67.8%	50.0%	93.5%	91.2%	93.3%	0.8%	3.9%
	LE Trawl- Whiting		32.4%	0.0%	8.2%	5.9%	98.7%	
	LE Fixed Gear	18.0%	5.3%	3.2%	0.6%	0.7%	0.4%	45.1%
Action Alt. 3	OA: Directed Groundfish	14.2%	12.4%	3.2%	0.1%	0.1%	0.1%	51.0%
	Recreational Groundfish impacts							
	WA		9.8%					42.2%
	OR		28.6%				3.2%	39.9%
	CA	100.0%	61.6%	0.0%			96.8%	17.9%

4.5.3 No Action Alternative

[To be completed after the June Council meeting. For quantitative impact analysis of the No Action alternative, see 4.5.4.]

4.5.3.1 Limited Entry Trawl Impacts

4.5.3.2 Limited Entry Fixed Gear Impacts

4.5.3.3 Open Access Impacts

4.5.3.4 Nearshore Commercial Impacts

4.5.3.5 Tribal Fishery Impacts

4.5.3.6 Washington Recreational Impacts

4.5.3.7 Oregon Recreational Impacts

4.5.3.8 California Recreational Impacts

4.5.4 The Action Alternatives

When evaluating the impacts associated with the action alternatives, there are several general points that may be important to bear in mind.

First, as a depleted species' spawning stock biomass nears a rebuilt level ($B_{40\%}$), the probability of fishing encounters with that species increases. When more of the stock is available to the fishery but the allowable catch remains at a low level, there is a greater chance that the OY could be reached early in the season or exceeded. This is particularly relevant with respect to darkblotched rockfish, Pacific ocean perch, and widow rockfish. Given that these species are primarily caught incidentally in trawl fisheries, concerns of increased encounters are most notable for those fleets. Furthermore, the proposed management measures under all action alternatives bring about impact estimates at or just below the proposed OY for Pacific ocean perch (Tables 2-14, 2-19 and 2-21). Without an excess of allowable impacts to buffer against the uncertainty associated with a biomass near a rebuilt level, there is a risk under each action alternative that the Pacific ocean perch OY could be exceeded. A similar situation may occur under Action Alternative 1 with respect to widow rockfish, as there is only a very small residual (3% of OY or 3.8 mt). In the scorecards that explore the different allocation scenarios (Tables 4-43 through 4-50), the residual is maintained for these three depleted species under the high OY scenario. Under the low OY scenarios, there is no residual for any of these depleted species.

Second, as the discard estimates from WCGOP improve, it is likely that discard rates used to manage those fisheries with a lesser amount of at-sea observations (i.e., southern limited entry and open access fixed gear fisheries) will change dramatically. This is a particular concern if new discard rates prove to be much higher than currently assumed based on limited at-sea observations. As this information is used to better inform managers about catch of depleted species, inseason action may be necessary to correct management measures that had been crafted according to current discard rates.

Variability in a stock's recruitment success is another source of uncertainty (see section 4.4.2.1). Such variability is most common among winter-spawning shelf and slope groundfish, such as bocaccio, lingcod, and Pacific whiting. For these species, improved population trajectories over recent years can be aligned with climate shifts; for other species, such as cowcod and widow, the improvement in population trends is primarily due to deterministic recruitment trends and reduced harvest rates. The uncertainty surrounding the recruitment success of these species may provide additional support for managing fishing impacts to a value lower than the OY.

The considerations discussed above bring about a cumulative risk of exceeding the OY for certain depleted species. Much of this risk can be attributed to numerous sources of uncertainty, which are discussed further in section 4.2.

General Action Alternative 1 Considerations

The management measures proposed in Action Alternative 1 all constrain fisheries below the Council preferred low OYs for depleted species (Table 2-14). However, for some species (i.e., Pacific ocean perch, widow rockfish, and bocaccio), there is little or no residual available to managers to buffer against uncertainty.

Under these low OYs, the Council must evaluate whether viable fisheries can be maintained. If it is determined that the management measures under Action Alternative 1 do not allow for viable fisheries, then other allocation scenarios may be considered by the Council (see discussion in 4.5.2.2 on allocating the entire OYs to the recreational fishery or to the commercial fishery).

The Council preferred low OYs bring about a similar situation to what is portrayed under Rebuilding Alternative 5. Under both of these, the management measures could result in fisheries that are equally constrained by most, if not all, of the depleted species' OYs. Though this suggests the need for additional room to buffer against management uncertainty, this is countered against the severe social and economic consequences that would be made even more acute by managing to a mortality impact lower than the OY.

General Action Alternative 2 Considerations

The management measures proposed in Action Alternative 2 are projected to constrain the depleted species impacts of all fisheries to levels that are intermediate between the Council preferred low and high OYs (Table 2-19). For some species (i.e., bocaccio, cowcod, and widow rockfish) under this action alternative, there is a large difference between the projected impacts and the high OY alternative. For Pacific ocean perch, on the other hand, the projected impact is nearly equal to the Council preferred high OY value. Unlike Action Alternative 1, this alternative allows for the higher values of research impacts for all depleted species.

General Action Alternative 3 Considerations

The management measures proposed in Action Alternative 3 are projected to constrain the depleted species impacts of all fisheries to levels at or below the Council preferred high OYs (Table 2-21). The anticipated impact to Pacific ocean perch, however, is equal to the high OY under this alternative. This alternative allows for the higher values of research impacts for all depleted species.

4.5.4.1 Limited Entry Trawl Impacts

The estimated impacts of the non-whiting limited entry trawl sector on depleted species and on target species under the action alternatives are displayed in Table 4-52. In 2005 a new management measure was implemented mandating the use of selective flatfish trawls shoreward of the trawl RCA north of 40°10' N latitude; Table 4-53 projects impacts to depleted and target species that would be expected if selective flatfish trawl gear were used by vessels south of 40°10' N latitude.

Table 4-52. Estimates of impacts (mt) to depleted species and total target catch associated with the limited entry non-whiting trawl fishery under the alternatives, without use of selective flatfish trawl gear in the south.

		No Action	Action Alternative 1			Action Alternative 2			Action Alternative 3		
		Total	North	South	Total	North	South	Total	North	South	Total
Depleted species	Canary	7.8	2.5	1.2	3.7	4.4	3.1	7.5	5.4	3.1	8.5
	POP	63.3	32.4	0.0	32.4	85.6	0.0	85.6	85.9	0.0	85.9
	Darkblotched	160.3	49.5	17.2	66.7	133.7	45.9	179.6	135.1	45.9	181.1
	Widow	1.0	0.1	0.0	0.1	1.0	0.1	1.0	1.0	0.1	1.0
	Bocaccio	47.4	0.0	9.1	9.1	0.0	50.5	50.5	0.0	50.5	50.5
	Yelloweye	0.3	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
	Cowcod	2.7	0.0	0.2	0.2	0.0	2.9	2.9	0.0	2.9	2.9
Target species	Sablefish		1,269	431	1,700	1,779	558	2,337	1,798	558	2356.0
	Longspine		171	335	507	178	577	756	178	577	755.5
	Shortspine		304	268	572	597	376	973	598	376	974.2
	Dover		3,266	891	4,157	8,352	2,458	10,809	8,407	2,458	10865.1
	Arrowtooth		1,311	19	1,330	5,192	51	5,243	5,117	51	5168.1
	Petrale		1,403	256	1,659	2,078	369	2,447	2,092	369	2460.8
	Other Flatfish		197	334	531	623	694	1,317	626	694	1319.7
	Slope Rockfish		113	209	322	173	351	523	173	351	523.5

Table 4-53. Estimates of impacts (mt) to depleted species and total target catch associated with the limited entry non-whiting trawl fishery under the alternatives, with use of selective flatfish trawl gear in the South.

		Action Alternative 1			Action Alternative 2			Action Alternative 3		
		North	South	Total	North	South	Total	North	South	Total
Depleted Species	Canary	2.5	0.9	3.4	4.4	2.4	6.8	5.4	2.4	7.8
	POP	32.4	0.0	32.4	85.6	0.0	85.6	86.0	0.0	86.0
	Darkblotched	49.5	17.2	66.7	133.7	45.9	179.6	135.1	45.9	181.1
	Widow	0.1	0.0	0.1	1.0	0.1	1.0	1.0	0.1	1.0
	Bocaccio	0.0	9.1*	9.1	0.0	50.5*	50.5	0.0	50.5*	0.0
	Yelloweye	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2
	Cowcod	0.0	0.2*	0.2	0.0	2.9*	2.9	0.0	2.9*	0.0
Target Species	Sablefish	1,269	431	1,700	1,779	558	2,337	1,798	558	2356.0
	Longspine	171	335	507	178	577	756	178	577	755.5
	Shortspine	304	268	572	597	376	973	598	376	974.2
	Dover	3,266	891	4,157	8,352	2,458	10,809	8,407	2,458	10865.1
	Arrowtooth	1,311	19	1,330	5,192	51	5,243	5,117	51	5168.1
	Petrale	1,403	256	1,659	2,078	369	2,447	2,092	369	2460.8
	Other Flatfish	197	334	531	623	694	1,317	626	694	1319.7
	Slope Rockfish	113	209	322	173	351	523	173	351	523.5

Note: * indicates that differences in bycatch for these species may occur, but the degree of change is unknown

The bycatch analysis for the Pacific whiting trawl fishery (Table 4-54) assumes that the total US Pacific whiting catch will decrease in accordance with the allowable impacts to depleted species. An alternative strategy for managing 2007-2008 whiting fisheries would be to impose bycatch caps for these species and allow the fleet flexibility to avoid these species while attempting to attain their whiting quotas.

Table 4-54. Estimates of impacts to depleted species and total target catch associated with the Pacific whiting fishery under the alternatives.

Action Alternatives	Total US Catch (mt)	Sector	Allocation (mt)	Impact to depleted species (mt)				
				Canary	Darkblotched	POP	Widow	Yelloweye
No Action		Tribal		1.6	0.0	1.0	6.1	-
		Mothership			4.7	2.9		0.0
		CP		4.7	6.3	1.8	200.0	0.0
		Shoreside			5.2	0.6		0.0
		Total		6.3	16.2	6.3	206.1	0.0
Alternative 1	150,000	Tribal	25,000	1.1	0.0	0.5	4.3	-
		Mothership	29,520	1.8	2.5	0.5	15.3	0.0
		CP	41,820	0.4	3.3	1.6	26.5	0.0
		Shoreside	51,660	0.7	2.8	0.9	22.6	0.0
		Total		4.0	8.6	3.5	68.7	0.0
Alternative 2	200,000	Tribal	27,500	1.2	0.0	0.5	4.8	-
		Mothership	40,920	2.5	3.4	0.7	21.2	0.0
		CP	57,970	0.5	4.6	2.2	36.8	0.0
		Shoreside	71,610	1.0	3.8	1.3	31.3	0.0
		Total		5.2	11.9	4.7	94.0	0.0
Alternative 3	260,000	Tribal	35,000	1.6	0.0	0.6	6.0	-
		Mothership	53,520	3.2	4.5	0.9	27.7	0.0
		CP	75,820	0.7	6.0	2.8	48.1	0.0
		Shoreside	93,660	1.3	5.0	1.7	41.0	0.0
		Total		6.8	15.5	6.1	122.8	0.0

4.5.4.2 Limited Entry Fixed Gear Impacts

Sablefish Alternatives

The impacts associated with the action alternatives for sablefish (Table 4-55) are arrayed by A) holding the allocations for sablefish constant for the limited entry and open access fixed gear sectors under the Council's preferred sablefish OY and moving the fixed gear RCA line north of 40°10' N latitude from 100 to 125 and 150 fm respectively, and B) by lowering the OY for sablefish to achieve the same reductions in bycatch as by moving the fishery in the north out to the 125 fathom line and the 150 fathom line. These results show that savings in bycatch are achieved by advancing the line further seaward, or by lowering the sablefish allocation to these sectors, but either case creates an economic cost to sablefish fishers.

A review of West Coast groundfish observer data shows that sablefish vessels currently fish at depths deeper than 150 fm north of 40 degrees 10 minutes latitude, but for vessels that homeport in the Puget sound region of Washington, a 150 fathom line eliminates their fishing areas and would require vessels to fish substantially further south and further out to sea. This is because the shelf and slope areas off northern Washington are comprised of multiple canyons and broad areas with relatively the same depth. In other areas of the coast the bottom depths get deeper in a more continuous fashion as one moves further out to sea. Those vessels that don't home port in the Puget sound region and that currently don't fish at depths outside of 150 fm would need to travel further out to sea, however the additional distance required of these vessels to fish outside 150 fm is minor compared to vessels that home port in the Puget sound area.

Reducing the sablefish allocation is shown to give a comparison between area closures and reductions in target species catch that would achieve the same levels of bycatch. Reducing the sablefish allocation for these sectors would decrease bycatch because vessels would fish less and thereby exert less effort on the areas where overfished species are found. While reducing the sablefish allocations for limited entry and open access fixed gear vessels would decrease the catch and revenues to these vessels, it would allow vessels to fish closer to shore and decrease the cost of accessing that sablefish when compared to imposing fathom restrictions that achieve the same reductions.

Table 4-55. Impact estimates associated with all fixed gear sablefish fisheries.

	Council Preferred Sablefish OY with Changes in Fathom Line			Reduced OY with Constant Fathom Line	
	Action Alt. 1	**Action Alt. 2**	**Action Alt. 3**	**Action Alt. 2b**	**Action Alt. 1b**
	150 North: 150 South[3]	125 North: 150 South[2]	100 North: 150 South[1]	100 North: 150 South[1]	100 North: 150 South[1]
Total catch OY (mt)	5934	5934	5934	4450	2225
Landed Catch (mt)	2411	2411	2411	1800	885
Projected impacts (mt)					
Widow rockfish	0.00	0.00	0.02	0.01	0.01
Canary rockfish	0.13	0.39	0.57	0.43	0.21
Yelloweye rockfish	0.47	0.96	1.28	0.96	0.47
Bocaccio rockfish	0.00	0.00	0.00	0.00	0.00
Cowcod rockfish	0.00	0.00	0.00	0.00	0.00
Pacific ocean perch	0.27	0.36	0.29	0.22	0.11
Darkblotched rockfish	1.23	0.94	0.80	0.60	0.29

[1]Seaward boundary of RCA at 100 fm North of 40^{o}10' and at 150 fm South of 40^{o}10'

[2]Seaward boundary of RCA at 125 fm North of 40^{o}10' and at 150 fm South of 40^{o}10'

[3]Seaward boundary of RCA at 150 fm North of 40^{o}10' and at 150 fm South of 40^{o}10'

Impacts associated with the non-sablefish limited entry fixed gear sector (primarily targeting spiny dogfish and Pacific halibut) are displayed in Table 4-56.

Table 4-56. Impact estimates associated with the limited entry fixed gear sector (non-sablefish).

		Alternatives			
		No Action	Action Alt. 1	Action Alt. 2	Action Alt. 3
Impact to Depleted Species (mt)	Canary	0.2	0	0.1	0.2
	Darkblotched	0.4	0.4	0.4	0.4
	POP	0	0	0	0
	Widow	0.5	0.5	0.5	0.5
	Yelloweye	1.3	0.2	0.6	1.3
Impact to Target Species (lbs)	Spiny dogfish	530,211	150,268	262,667	530,211
	Pacific halibut	923,295	249,290	923,295	923,295

4.5.4.3 Open Access Impacts

Like with the limited entry fixed gear fisheries, the primary means to constrain impacts of the open access sector on depleted species is by changing the non-trawl RCA boundaries. The specific impacts under each of the action alternatives have been quantitatively assessed for only some portions of this diverse sector, however. Table 4-56 depicts the projected impacts for all sablefish fisheries (limited entry and open access) and section 4.5.4.3 discusses the impacts of the open access nearshore commercial fisheries.

4.5.4.4 Nearshore Commercial Impacts

Table 4-57 depicts the estimated total mortality of nearshore commercial fisheries under each action alternative. The management measures proposed within Action Alternative 3 are the same as the No Action alternative, and therefore the estimated impacts for these two alternatives are equal. Under the most restrictive management measures (Action Alternative 1), the catch of black rockfish north of 40°10' N latitude is projected to drop by 60% from status quo, while the catch of other target species is projected to be maintained at SQ levels. South of 40°10' N latitude catch of shallow and deeper nearshore species, cabezon, and kelp greenling under Action Alternative 1are all expected to reduce by about 15% due to the proposed area and depth restrictions.

Table 4-57. Open access nearshore commercial fisheries' estimated total mortality (mt) and its percent reduction from status quo under each alternative.

		No Action	Action Alt. 1		Action Alt. 2		Action Alt. 3	
		Mortality (mt)	Mortality (mt)	Reduction (%)	Mortality (mt)	Reduction (%)	Mortality (mt)	Reduction (%)
South of 40 10, North of 34 27	Canary	0.28	0.26	21%	0.30	7%	0.28	0%
	Shallow nearshore species	47	47	16%	55	1%	47	0%
	Deeper nearshore species	42	40	17%	47	3%	42	0%
	Cabezon	29	39	15%	46	0%	29	0%
	Kelp Greenling	1.0	3.0	15%	3.0	0%	1.0	0%
North of 40 10	Canary	1.83	0.72	56%	1.17	29%	1.83	0%
	Yelloweye	2.41	0.81	62%	1.32	38%	2.41	0%
	Widow	0.08	0.03	53%	0.05	24%	0.08	0%
	Black Rockfish	170	70	60%	158	10%	170	0%
	Blue Rockfish	11	10	1%	10	1%	11	0%
	Other minor nearshore rockfish	36	10	0%	10	0%	36	0%
	Cabezon	33	31	0%	31	0%	33	0%
	Kelp Greenling	21	23	0%	23	0%	21	0%
Depleted Species Total	Canary	2.11	0.98	50%	1.47	25%	2.11	0%
	Yelloweye	2.41	0.81	62%	1.32	38%	2.41	0%
	Widow	0.08	0.03	53%	0.05	24%	0.08	0%

4.5.4.5 Tribal Fishery Impacts

Table 4-58 depicts the projected impacts to the depleted and target species associated with all tribal groundfish fisheries. The estimated impacts to depleted species are the same across all action alternatives (and are the same as the No Action alternative).

The projected catch of spiny dogfish is significantly higher under the action alternatives than under no action. The Makah Tribe is proposing a directed longline fishery for spiny dogfish for 2007 and 2008. The fishery would be restricted to the Limited Entry trip limits. Increased landings of dogfish by treaty fishermen in 2007 and 2008 would be dependent on successful targeting in 2006 while staying within current estimates of impacts on overfished species. The projected value for spiny dogfish landings in Table 4-58 (600,000 lbs or 272.2 mt) is a placeholder provided by Makah Fisheries Management; impacts will not be known until the test fishery is prosecuted. In addition, flatfish and rockfish impacts under all action alternatives are expected to increase by 25% due to increased effort (though not capacity) in Makah trawl fisheries.

Table 4-58. Estimates of impacts to species associated with the Tribal fishery under the alternatives.

		Alternatives			
		No Action	Action Alt. 1	Action Alt. 2	Action Alt. 3
Impact to depleted species	Canary rockfish	3.4	3.4	3.4	3.4
	Darkblotched rockfish	0.1	0.1	0.1	0.1
	Widow rockfish	40.0	40.0	40.0	40.0
	Yelloweye rockfish	2.3	2.3	2.3	2.3
Impact to non-depleted species	Pacific whiting	34,357	25,000	27,500	35,000
	Sablefish	719.4	561.4	561.4	561.4
	Yellowtail rockfish	539.4	539.4	539.4	539.4
	Flatfish spp.	446.7	558.4	558.4	558.4
	Pacific Cod	400.0	400.0	400.0	400.0
	Spiny dogfish	5.9	272.2	272.2	272.2
	Lingcod	29.8	29.8	29.8	29.8
	Skate spp.	23.2	23.2	23.2	23.2
	Unspecified rockfish				
	Slope rockfish	28.6	28.6	28.6	28.6
	Near-shore rockfish	0.2	0.2	0.2	0.2
	Shelf rockfish	9.3	9.3	9.3	9.3
	Walleye pollock	19.6	19.6	19.6	19.6
	Shortspine thornyhead	10.8	13.5	13.5	13.5
	Longspine thornyhead	0.2	0.2	0.2	0.2

4.5.4.6 Washington Recreational Impacts

Management measures proposed under the action alternatives serve to constrain the Washington recreational fishery to impacts on canary rockfish and yelloweye rockfish lower than those under the No Action alternative (Table 4-59).

Table 4-59. Estimates of impacts to depleted species associated with the Washington recreational fishery under the alternatives.

			Alternatives			
			No action	**Action Alt. 1**	**Action Alt. 2**	**Action Alt. 3**
Depleted species impacts (mt)	Canary	North Coast	1.4	0.5	0.6	1.1
		South Coast	0.2	0.2	0.2	0.2
		Columbia	0.0	0.0	0.0	0.0
		Total	1.6	0.7	0.8	1.4
	Yelloweye	North Coast	3.2	1.2	1.4	2.5
		South Coast	0.5	0.4	0.4	0.5
		Columbia	0.0	0.0	0.0	0.0
		Total	3.8	1.5	1.8	3.1

4.5.4.7 Oregon Recreational Impacts

Management measures proposed under the action alternatives serve to constrain the Oregon recreational fishery to depleted species impacts lower than those under the No Action alternative (Table 4-60). These measures also restrict the catch of target species (with the exception of lingcod), which are projected to be equal or lower to No Action levels under all alternatives.

Table 4-60. Estimates of impacts to depleted species and to target species associated with the Oregon recreational fishery under the alternatives.

			No action	Action Alternatives				
				1a	1b	2	3a	3b
Impact to depleted species (mt)		Yelloweye	3.6	1.6	1.5	1.9	2.5	2.9
		Canary	5.3	1.6	2.3	2.6	3.7	4.0
		Widow	1.6	0.1	0.1	0.1	0.4	0.6
Impact to target species (mt)	Other nearshore rockfish species complex	Blue	34.1	20.8	27.6	30.7	30.9	30.9
		Brown	0.1	0.1	0.1	0.1	0.1	0.1
		China	2.2	2.1	1.9	1.9	2.0	2.0
		Copper	4.9	4.4	4.5	4.5	4.6	4.6
		Grass	1.4	1.3	1.3	1.3	1.3	1.3
		Quillback	3.3	3.6	3.0	2.9	2.9	2.9
		Total	45.9	32.3	38.4	41.4	41.7	41.7
		Black rockfish	328.7	308.1	294.1	293.7	294.2	294.2
		Vermilion rockfish	6.8	6.8	6.0	6.0	6.1	6.1
		Tiger rockfish	0.2	0.2	0.2	0.2	0.2	0.2
		Lingcod (2007)	209.2	141.8	199.1	192.4	225.1	230.0
		Lingcod (2008)	244.7	164.2	231.3	223.9	262.7	267.9
		Cabezon	19.1	17.8	17.2	17.3	17.3	17.3
		Kelp greenling	19.4	19.4	18.9	19.0	19.0	19.0
		Rock greenling	2.2	2.2	2.2	2.2	2.2	2.2

4.5.4.8 California Recreational Impacts

Table 4-61 depicts the projected impacts to depleted species under the action alternatives associated with the California recreational fisheries. Table 4-62 provides projected impacts to target species under the action alternatives.

Table 4-61. Estimates of impacts to depleted species associated with the California recreational fishery under the alternatives.

Alternatives		Impact to depleted species (mt) Bocaccio	Canary	Cowcod	Widow	Yelloweye
No Action	Total	98.0	9.3	0.4	8.0	3.7
Action Alt. 1	North region	N/A	0.5	N/A	0	0.8
	North Central	0.2	3	0	1.3	0.4
	S. Central - Monterey	1.8	0.3	0	0.1	0
	S. Central - Morro Bay	0.5	0.7	0	0	0
	South Region	13.4	0.3	0	0.2	0
	Total	15.9	4.8	0	1.6	1.2
Action Alt. 2	North region	N/A	0.7	N/A	0	0.9
	North Central	0.2	3.8	0	2.0	0.6
	S. Central - Monterey	1.8	0.3	0	0.1	0
	S. Central - Morro Bay	0.6	0.8	0	0	0
	South Region	29.1	0.3	0.1	1.1	0
	Total	31.7	5.9	0.1	3.2	1.5
Action Alt. 3	North region	N/A	0.7	N/A	0	0.7
	North Central	1.0	5.7	0	12.1	0.5
	S. Central - Monterey	12.0	0.6	0	1.0	0.0
	S. Central - Morro Bay	3.9	1.3	0	0	0.1
	South Region	89.9	0.3	0.3	5.2	0
	Total	106.8	8.6	0.3	18.3	1.3

Table 4-62. Estimates of impacts to target species associated with the California recreational fishery under the alternatives.

Alternatives		Impact to target species (mt)				
		Minor Nearshore Rockfish North	Minor Nearshore Rockfish South	CA Scorpion-fish	Lingcod	Lingcod + Dec Open (except SCMB)
Action Alt. 1	North region	17.1	N/A	0	51	55
	North Central	N/A	126	0	105	120
	S. Central - Monterey	N/A	98	0	26	29
	S. Central - Morro Bay	N/A	81	0	21	21
	South Region	N/A	58	79	22	29
	Total	17.1	363	79	225	254
Action Alt. 2	North region	17.3	N/A	0	51	55
	North Central	N/A	162	0	135	151
	S. Central - Monterey	N/A	98	0	26	29
	S. Central - Morro Bay	N/A	87	0	23	23
	South Region	N/A	57	74	24	33
	Total	17.3	404	74	259	291
Action Alt. 3	North region	14.8	N/A	0	42	46
	North Central	N/A	147	0	120	133
	S. Central - Monterey	N/A	114	0	29	32
	S. Central - Morro Bay	N/A	79	0	21	21
	South Region	N/A	61	75	28	37
	Total	14.8	401	75	240	269

5.0 PROTECTED SPECIES

Four different laws designate a species or stock as "protected" within U.S. waters: the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), the Migratory Bird Treaty Act (MBTA), and EO 13186. Briefly, the substance of these mandates is as follows:

- The ESA protects species in danger of extinction throughout all or a significant part of their range and mandates the conservation of the ecosystems on which they depend. "Species" is defined by the Act to mean a species, a subspecies, or—for vertebrates only—a distinct population. Under the ESA, a species is listed as "endangered" if it is in danger of extinction throughout a significant portion of its range and "threatened" if it is likely to become an endangered species within the foreseeable future throughout all, or a significant part, of its range.
- The MMPA guides marine mammal species protection and conservation policy off the U.S. West Coast. NMFS is responsible for MMPA-based management of cetaceans and pinnipeds, while the USFWS is responsible for sea otter management. Stock assessment reports review new information every year for strategic stocks and every three years for non-strategic stocks. "Strategic stocks" are those whose human-caused mortality and injury exceeds the potential biological removal level. (At 50 CFR 229.2, "potential biological removal level" is defined as, "the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population…") Marine mammals, whose abundance falls below the optimum sustainable population, are listed as "depleted" under the MMPA. All marine mammal species are protected under the MMPA, regardless of whether a particular species or stock is listed as threatened or endangered under the ESA.
- The MBTA implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful. In addition to the MBTA, an Executive Order, *Responsibilities of Federal Agencies to Protect Migratory Birds*, (EO 13186), directs federal agencies to negotiate Memoranda of Understanding with the USFWS that would obligate agencies to evaluate the impact on migratory birds as part of any NEPA process. All migratory seabird species are protected under the MBTA and EO 13186, regardless of whether a particular species or stock is listed as threatened or endangered under the ESA.

NMFS and PFMC have published recent NEPA documents that describe protected species found in the West Coast EEZ. The December 2005 Final EIS on "Pacific Coast Groundfish Fishery Management Plan Essential Fish Habitat Designation and Minimization of Adverse Impacts" (EFH EIS) {NMFS, 2005 1073 /id} provided descriptions of West Coast EEZ species protected under the ESA, the MMPA, and the MBTA and EO 13186 at Section 3.4 and provided information on fisheries interactions, where available and applicable. The December 2004 Final EIS on "Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish Fishery" (2005-2006 Specifications EIS) {PFMC, 2004 916 /id} provided descriptions of West Coast EEZ species protected under these same laws at Chapter 6, and analyzed the effects of the groundfish fisheries on these species.

- No new scientific analyses on the interactions between the groundfish fisheries and marine mammals have been completed since the publication of either the EFH EIS or the 2005-2006 Specifications EIS. NMFS publishes an annual list of fisheries in the Federal Register separating commercial fisheries into one of three categories based on the level of serious injury and mortality of marine mammals occurring incidentally in that fishery. The categorization of a fishery in the list of fisheries determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take reduction plan requirements. West Coast groundfish fisheries are designated as Category III fisheries, denoting a remote likelihood of, or no known, serious injuries or mortalities to marine mammals (71 FR 247, January 4, 2006).

- No new scientific analyses on the interactions between the groundfish fisheries and seabirds have been completed since the publication of either the EFH EIS or the 2005-2006 Specifications EIS. NMFS is compiling observer data on fisheries interactions with seabirds to develop a long-term assessment of the effects of the groundfish fisheries on migratory seabirds. This assessment is part of NMFS's work with the USFWS on a Memorandum of Understanding concerning seabirds and the groundfish fisheries, as required under EO 13168.
- No new scientific analyses on the interactions between the groundfish fisheries and sea turtles have been completed since the publication of either the EFH EIS or the 2005-2006 Specifications EIS {PFMC, 2004 1077 /id}. Four sea turtle species have been sighted off the U.S. West Coast: loggerhead (*Caretta caretta*), green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*), and olive ridley (*Lepidochelys olivacea*). Under the ESA, green, leatherback, and olive ridely sea turtles are listed as endangered; loggerheads are listed as threatened. NMFS has reviewed WCGOP data for fisheries interactions with sea turtles and WCGOP has not observed any sea turtle interactions in the groundfish fisheries.

Under the CEQ implementing regulations for NEPA at 40 CFR 1502.21, *Incorporation by Reference*, "Agencies shall incorporate material into an environmental impact statement by reference when the effect will be to cut down on bulk without impeding agency and public review of the action. The incorporated material shall be cited in the statement and its content briefly described. No material may be incorporated by reference unless it is reasonably available for inspection by potentially interested persons within the time allowed for comment. Material based on proprietary data which is itself not available for review and comment shall not be incorporated by reference." Based on these NEPA implementing regulations, the relevant content of the aforementioned EISs is incorporated by reference.

The 2005–06 groundfish harvest specifications EIS did not find that the proposed action would result in significant impacts to protected species, based on a qualitative evaluation of the alternatives. Although there was insufficient spatio-temporal information to predict interactions under different alternatives, projected catch, as a gross proxy for overall fishing effort, was used to comparatively evaluate the alternatives. It is important to note that groundfish trawl fishing effort as reported in logbooks has fallen over the past few years; for example, 110,512 tow-hours were reported in 2000 while 64,763 tow hours were logged in 2004. Declining groundfish trawl effort is a predictable response to lowered OYs and more restrictive management measures imposed to reduce bycatch of depleted groundfish and it is reasonable to conclude that non-trawl sectors experienced similar declines. Furthermore, because OYs for some depleted species—principally canary and yelloweye rockfish—have not increased, it is likely that fishing effort in 2005 and 2006, and the 2007–08 biennium is likely to continue a declining trend. Combined with the conclusion of no significant impact in the previous EIS, and the lack of new information suggesting otherwise, it is reasonable to conclude that the range of alternatives in the current EIS will not result in significant impacts to protected species. For this reason effects to sea turtles, marine mammals, and seabirds are not evaluated in further detail. However, given the new information contained in the 2006 supplemental biological opinion, this EIS focuses on impacts of the alternatives on the ESA-listed salmon ESUs identified in that opinion.

5.1 Affected Environment

According to the ESA, NMFS may conduct a "section 7 consultation" on a federally-authorized activity, such as fishing in EEZ waters, in order to determine whether that activity is likely to jeopardize the continued existence of an ESA-listed species. In 1990, NMFS conducted its first ESA section 7 consultation on Chinook salmon take in the groundfish FMP. Subsequent NMFS section 7 consultations in 1991, 1992, and 1993 concluded that Chinook was the ESA-listed salmon species most likely to be affected by the groundfish fisheries. Groundfish fishery interception of salmon species other than Chinook is negligible and infrequent {NMFS, 2006 1075 /id}. Of the ESA-listed Chinook evolutionarily significant units (ESUs,) NMFS has concluded that the ESUs most likely to be affected by the groundfish fisheries include: Snake River fall Chinook (threatened), Upper Willamette River Chinook (threatened), Lower Columbia River Chinook (threatened), Puget Sound Chinook (threatened), Sacramento River winter-run Chinook (endangered), California coastal Chinook (threatened), and Central Valley spring-run Chinook (threatened). The 1992 Biological Opinion also concluded that groundfish gears other than trawl gear are either unlikely to affect salmon, or to have no salmon bycatch at all {NMFS, 1992 1076 /id}. The incidental take statements for this and subsequent section 7 consultations established a consultation standard of 11,000 Chinook salmon caught in Pacific whiting fisheries. In other words, Chinook salmon bycatch exceeding this number in a given year would be a basis for re-initiating consultation to determine whether this new information indicates the action would jeopardize the continued existence of listed ESUs and considering further mitigation measures to reduce bycatch. The 1992 biological opinion estimated the take of salmon in other, non-whiting groundfish trawl fisheries at 6,000–9,000 fish annually, with most of these taken in waters north of 43° N latitude. As with the whiting fishery, almost all of these were estimated to be Chinook salmon. Historically the non-whiting groundfish trawl sector has not been comprehensively monitored for protected species bycatch and no similar re-initiation standard was established for this sector. However, with the implementation of the WCGOP it has become possible to estimate salmon bycatch in the non-whiting groundfish trawl sector more precisely.

The 11,000 fish threshold for re-initiation has been breached three times since 1991, most recently in 2005. In response, the latest supplemental biological opinion {NMFS, 2006 1075 /id} was prepared. The evaluation of impacts to protected species (focusing on listed Chinook salmon ESUs) substantially relies on this and previous opinions. Like the biological opinion, effects are considered in terms of two sectors: whiting and non-whiting groundfish trawl. Other groundfish fishery sectors are not considered, based on the conclusion in this and previous biological opinions that salmon bycatch is negligible in these sectors.

5.1.1 The Whiting Fishery

Salmon bycatch has generally been well below 11,000 fish consultation standard (averaging 7,281 since 1991); although, as noted, above it has been exceeded three times (see Table 5-1), in 1995 (14,533 fish), 2000 (11,513 fish), and 2005 (11,916 fish). Figure 5-1 breaks out the Chinook bycatch by the various whiting sectors over time.

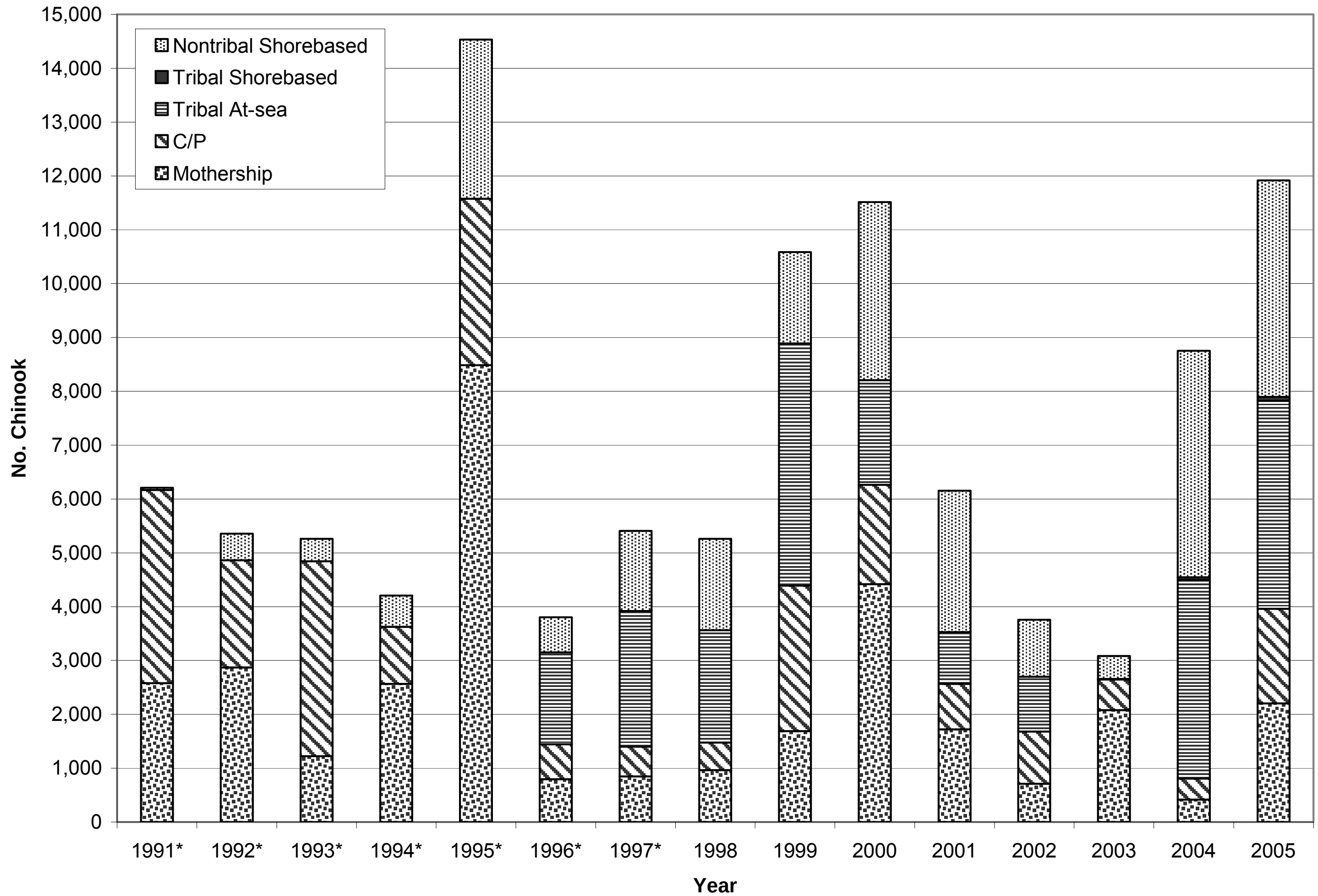
Both the absolute and relative effects of the different whiting subsectors may considered in describing past impacts. Table 5-2 shows, for the whole 1991–2005 period, both the bycatch rate (number of Chinook/mt whiting) and the percent of all Chinook caught for each subsector (number of Chinook caught by subsector/number caught in all sectors). The rate can be considered a measure of relative impact, or the intensity of the impact of a given subsector, while the percent of total indicates the absolute magnitude of impact for each subsector. It can be seen that tribal mothership sector has the highest relative impact (0.1171 Chinook/mt) but ranks second to last in terms of absolute impact. The nontribal mothership sector has had the highest absolute impact (31.73 percent) and the second-highest relative impact (0.0506 Chinook/mt). The catcher/processor sector has the lowest overall bycatch rate for the period followed (0.0219 Chinook/mt) and accounted for the third-lowest proportion of overall bycatch (22.81 percent). The tribal shorebased sector has only operated since 2003 and thus accounts for a very small share of total bycatch for the period.

Table 5-1. Annual bycatch of salmonids in the whiting fishery.

	Salmonid Species							
Year	Chinook	Coho	Pink	Chum	Sockeye	Steelhead	Unidentified	Total
1991	6,206	138	24	8	0	0	NA	6,376
1992	5,353	193	0	48	0	0	NA	5,594
1993	5,262	17	3397	58	116	0	NA	8,850
1994	4,207	69	32	214	0	0	NA	4,522
1995	14,533	1381	1590	182	6	0	NA	**17,692**
1996	3,803	64	0	178	0	0	NA	4,045
1997	5,404	350	497	114	0	0	NA	6,365
1998	5,261	122	4	35	1	0	NA	5,423
1999	10,584	122	507	465	0	0	NA	**11,678**
2000	11,513	101	18	19	2	0	18	**11,671**
2001	6,154	138	303	87	3	0	312	6,997
2002	3,759	183	0	148	0	0	4	4,094
2003	6,512	186	3774	20	0	0	192	10,684
2004	8,751	216	0	109	0	0	9	9,085
2005	11,916	467	480	28	0	0	8	**12,899**
Average	7,281	250	708	114	9	0	91	8,398

Source: NMFS 2006

Figure 5-1. Summary of Chinook salmon bycatch in the Pacific whiting Fishery by sector in number of fish, 1991-2005. {“Data from Table 4 in” /pt NMFS, 2006 1075 /id “.” /ft}



* NOTE: 1991-1997 is based final inseason data files and may vary from estimates derived from NORPAC data. Shoreside data updated from Nottage and Parker 2005.
2002 shore-based landings does not include 432 mt of whiting or salmon taken in trip limit fishery
2003 shore-based landings does not include 195 mt of whiting or salmon taken in trip limit fishery
2004 shore-based landings does not include 1,644 mt of whiting or salmon taken in trip limit fishery - first year of video monitoring at-sea 2005 shore-based landings does not include 310 mt of whiting or salmon taken in trip limit fishery

Table 5-2. Relative impact (average Chinook salmon/mt whiting) and absolute impact (percent of all Chinook caught 1991–2005) by whiting sector.

	Relative Impact (rate)	Absolute Impact (% all Chinook)
Mothership	0.0506	31.73%
Catcher/Processor	0.0219	22.81%
Nontribal Shorebased	0.0246	24.25%
Tribal Mothership	0.1171	21.07%
Tribal Shorebased	0.0066	0.13%

The supplemental biological opinion summarizes previous work to identify causative factors that would account for variations in salmon bycatch. On an annual basis there is some temporal and spatial variation in bycatch that can be accounted for by the behavior and biology of Chinook salmon and Pacific whiting. Bycatch rates send to higher closer to shore and earlier in the season. This may explain, for example, the high bycatch rate for the tribal mothership sector, since these vessels fish within the U&As, and thus have less flexibility to make spatial adjustments in response to salmon bycatch. Similarly, the shorebased sector, for cost and operational reasons, tends to fish closer to shore. However, no such factors adequately account for inter-annual variation in bycatch. Pervious work found no "obvious or consistent correlation" between annual Chinook abundance and bycatch {NMFS, 2006 1075 /id " , page 19" /ft}. Ocean conditions may play a role but specific causative factors, at least any that can be used predicatively, cannot be identified.

Although the 11,000 fish threshold is used a trigger to re-initiate consultations, the biological opinions produced in the course of these consultations have not concluded that occasionally exceeding this threshold (as occurred in 1995, 2000, and 2005) is not by itself a basis for making a jeopardy determination. In its 2006 supplemental biological opinion, NMFS reaffirmed this conclusion with respect to the 2005 fishery. In reaffirming this conclusion, the supplemental biological opinion notes that on average bycatch has been well below this threshold, averaging about 7,300 Chinook over the last 15 years. Furthermore, the status of the Chinook ESUs most likely to be affected by the whiting fishery has generally improved since the 1999 section 7 consultation.[22]

During the 2005 fishery, when it became apparent to NMFS that the whiting fishery could exceed the 11,000 Chinook level, the agency took emergency action to close the fishery shoreward of a boundary line approximating the 100 fm depth contour (70 FR 51682, August 31, 2005). This may prove to be a valuable mitigation measure and for 2006 EFP for the shore-based whiting sector allows NMFS to invoke a similar closure if bycatch threatens to exceed the 11,000 fish threshold. At the same time the Council has not recommended a blanket nearshore area closure throughout the whiting season because such a closure would force the whiting fishery into offshore waters where canary and darkblotched rockfish bycatch may be high. The more flexible approach of applying this mitigation measure in response to conditions in the fishery allows industry and NMFS tradeoff the impacts of salmon bycatch (more prevalent in inshore waters) and bycatch of the two depleted rockfish species (which occur more often in offshore waters).

During the 2005 fishery, when it became apparent to NMFS that the whiting fishery could exceed the 11,000 Chinook level, the agency took emergency action to establish a new salmon conservation zone. The new zone was referred to as the Ocean Salmon Conservation Zone and was defined as all waters shoreward of a boundary line approximating the 100-fm (183-m) depth contour (70 FR 51682, August 31, 2005). Fishing for whiting during the remaining portion of the 2005 primary season was prohibited

[22] The 1999 re-initiation was in response to the listing of 22 additional salmonid ESUs since the previous consultation.

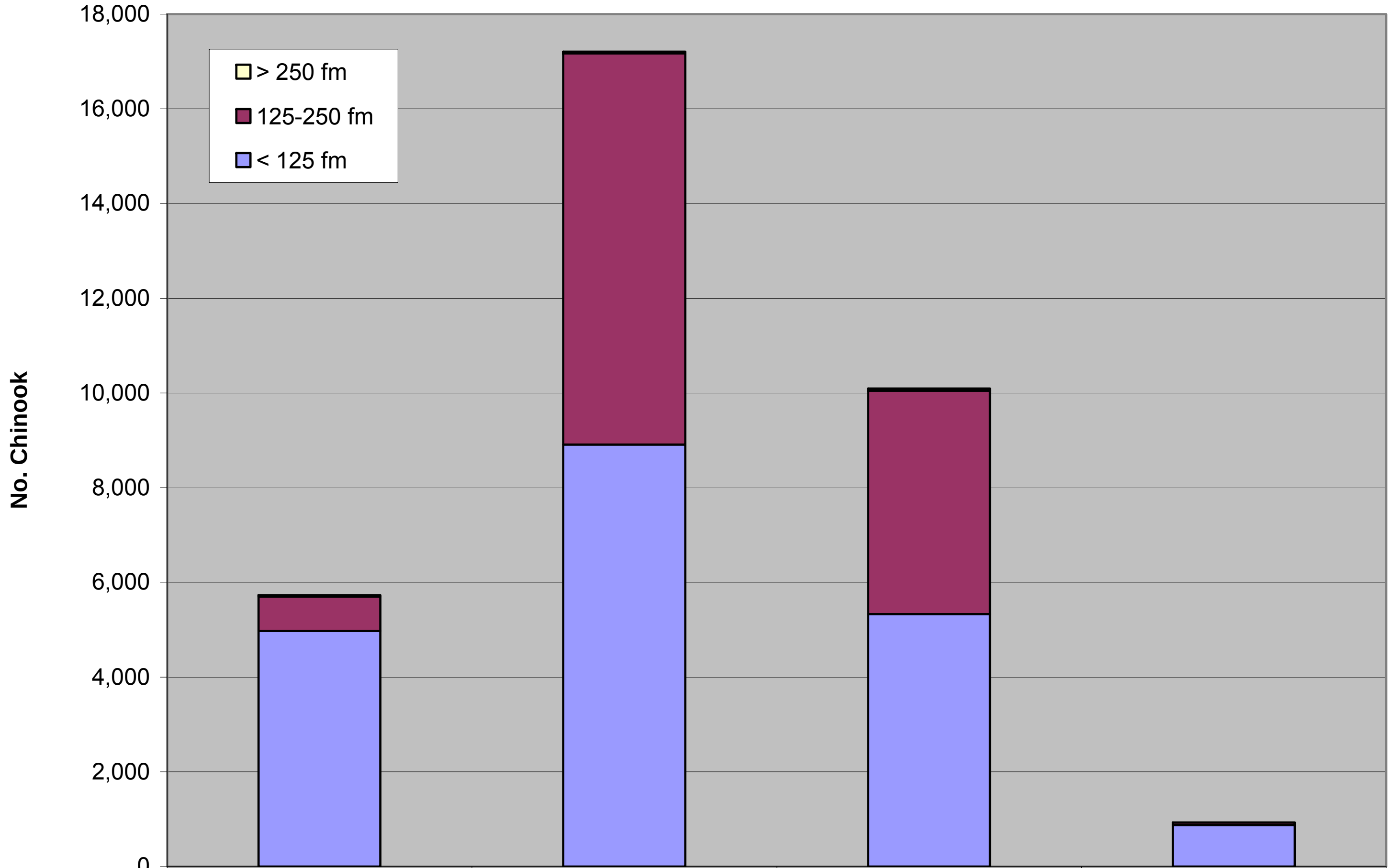
within the Ocean Salmon Conservation Zone. For 2006, NMFS will continue to monitor Chinook catch in the whiting fishery. If the 11,000 Chinook threshold is projected to be reached before the whiting allocation is projected to be reached, provisions within the terms and conditions of the EFPs that are issued to the shore-based participants would allow the Ocean Salmon Conservation Zone to be reinstated for the shore-based sector. If the Ocean Salmon Conservation Zone is reinstated for the shore-based sector, the at-sea sectors will be asked to voluntarily fish deeper than the 100 fm depth contour for the remainder of the 2006 primary whiting season. A substantial portion of the shore-based whiting fishery has occurred inside the 100 fm depth contour in recent years, while the at-sea sectors have voluntarily fished in deeper waters to avoid Chinook salmon. Having the Ocean Salmon Conservation Zone in effect throughout the whiting season was not recommended by the Council because such a closure could shift effort into offshore waters between 100 fm and 150 fm where historical data indicates there are higher catch rates for canary and darkblotched rockfish. Maintaining the ability to close the whiting fishery in the nearshore area inseason provides the fishery participants with flexibility to avoid overfished species, but maintains a mechanism for reducing the incidental take of Chinook salmon.

5.1.2 Limited Entry Bottom Trawl Fishery

As noted above, estimates of Chinook salmon bycatch for the (non-whiting) bottom trawl fishery have only recently become available. Data from the WCGOP were used to estimate 18,120 salmon caught in 2002, 13,862 fish in 2003, and 1,978 fish in 2004. Virtually all of the salmon caught were Chinook salmon (see Table 11 in NMFS 2006). Since these bycatch levels exceed the previous estimate of 6,000–9,000 Chinook specified in previous incidental take statements, NMFS also reinitiated its consultation on the Groundfish FMP and included an evaluation in the most recent, 2006 supplemental biological opinion. The previous estimates of salmon bycatch in the bottom trawl fishery were extrapolated from two coastwide research studies, one related to discards conducted from 1985 to 1987, and a second related to mesh size conducted from 1988 to 1990 {NMFS, 1992 1076 /id}. These were the only relevant data sources until NMFS began placing observers on bottom trawl vessels in August 2001.

The magnitude and distribution of bycatch in the trawl fishery from 2002 to 2004 was affected by significant changes in regulation and management of the fishery to protect overfished groundfish stocks. Between 1999 and 2002, NMFS declared eight groundfish species as overfished pursuant to the MSA (see Chapter 1). In response, one of the Council's major tools for reducing incidental interception of overfished groundfish has been the RCAs, large-scale marine area closures. The last several years has been a period of significant change for the fishery as it has had to adjust to the need to manage under the strict harvest limits for a complex of overfished species. The evolution and testing of RCAs and other regulatory strategies is ongoing, but fishery management and regulation substantially changed in the 2002–04 time period. Because of changing regulations, shifts in fishing areas, reductions in trawl fishery effort from the December 2003 trawl vessel and permit buyback program, and gear innovations (including the new selective flatfish trawl gear) coastwide, it is difficult to pinpoint which of these various factors may be affecting Chinook bycatch negatively or positively.

The supplemental biological opinion evaluates Chinook salmon bycatch by latitudinal and depth strata based on estimates from WCGOP data. Figure 5-2 aggregates this information (Table 12 in the supplemental biological opinion) across the three years of available data. The highest bycatch occurs in depths less than 125 fm across all latitudinal strata with the highest overall bycatch occurring off the Oregon coast from Cape Falcon to Cape Blanco, followed by the region to the south to Cape Mendocino in northern California. Looking at latitudinal differences alone, over the three years 56% of estimated Chinook bycatch occurred in the Cape Falcon-Cape Blanco region; in 2003 two-thirds of estimated bycatch was from that region. The 2006 supplemental biological opinion notes that "more bycatch, in the bottom trawl fishery in particular, was shifted south into northern California than was previously thought" (page 30). As a result Sacramento winter-run Chinook, California coastal Chinook, and Central Valley spring-run Chinook may be disproportionately affected. However, component ESUs for these stocks have increased or remained stable over the past 10 years.



	US/Canada Border to Cape Falcon	Cape Falcon to Cape Blanco	C. Blanco to C. Mendocino	C. Mendocino to US/Mex Border
> 250 fm	30	37	47	0
125-250 fm	724	8,264	4,713	57
< 125 fm	4,975	8,907	5,332	875

Area

Figure 5-2. Aggregated estimate of Chinook bycatch 2002–04 in the groundfish bottom trawl sector. (Data from Table 12 in NMFS 2006.)

Take of Chinook salmon in the trawl fishery is a relatively rare event with a few tows accounting for a disproportionate share of the estimates of catch. Thus, in terms of salmon bycatch, the distribution of effects is highly skewed. As a result, comparing tows within a given spatio-temporal sampling stratum, approximately 45 percent of all observed Chinook bycatch occurs in the single largest tow for any given stratum. For example, in the 2002 Cape Falcon-Cape Blanco and less-than-125-fathom-depth stratum there were 341 observed tows. One or more salmon was observed in only 24 of these tows while a single tow accounted for 179 salmon, which was 56 percent of all the observed salmon used to derive the estimate of 2,207 Chinook for that stratum.

This skewed distribution in the occurrence of salmon also affects the reliability of estimates derived from subsamples. In the groundfish bottom trawl sector only a portion of tows are observed. Even in the whiting fishery, where there is 100 percent observer coverage, observers may subsample some hauls rather than counting all fish brought aboard.

Although the estimated bycatch in 2002 and 2003 was substantially above the 6,000–9,000 expected salmon bycatch range articulated in the incidental take statement from the 1999 consultation, in the 2006 supplemental biological opinion NMFS reaffirmed 9,000 Chinook as a benchmark for making a jeopardy determination. As in the whiting fishery, exceeding this value in any one year is not by itself a reason for concluding jeopardy. NMFS therefore reaffirmed its prior determination that implementation of the Groundfish FMP is not likely to jeopardize the continued existence of any of the affected ESUs. However, in response to the larger than expected bycatch in two of three sample years NMFS will continue to monitor and collect data to analyze take levels.

5.2 Criteria Used to Evaluate Impacts

Focusing on potentially significant impacts, the impact of incidental catches of ESA-listed Chinook is evaluated in this chapter, using the supplemental biological opinion {NMFS, 2006 1075 /id} and previous opinions to provide a framework for evaluating impacts. Broadly, the threshold for significant impacts can be correlated with the thresholds used to assess jeopardy: 11,000 Chinook salmon in the whiting fishery and 9,000 fish in the non-whiting groundfish bottom trawl fishery. As noted, occasional bycatch over these thresholds is not by itself a reason to conclude jeopardy, and by the same token would not be a basis for concluding that a given alternative is likely to result in significant impacts to a listed Chinook salmon ESU. The supplemental biological opinion also proposes a variety of management measures, which would be implemented through this harvest specifications process, to reduce Chinook bycatch. This suggests that Chinook bycatch in any one year as high as 14,000 in the whiting fishery, which approximates the maximum bycatch, observed in 1995, would not be a significant impact but the likelihood that the 11,000 Chinook threshold will be exceeded several years could be considered a significant impact. This suggests the following criterion and threshold that could be used to evaluate the impacts on listed Chinook salmon ESUs:

- Is the alternative likely to result in bycatch in the whiting fishery of more than 14,000 Chinook in either 2007 or 2008 or would the average bycatch for the 2005–08 period exceed 11,000 fish?

A similar criterion could be developed for the groundfish bottom trawl sector, based on the incidental take statement estimate and recent estimates of single-year bycatch. However, given that the 2002 maximum bycatch value is almost double the 9,000 fish benchmark, that the data series is very limited, and there are wide confidence limits on the estimates due to the skewed nature of bycatch occurrence on a tow-by-tow basis, it would not be reasonable to use the maximum bycatch value in a similar fashion. However, the 1995 maximum in the whiting fishery is approximately one-third above the 11,000 fish consultation standard. This suggests a parallel criterion would be:

- Is the alternative likely to result in bycatch in the groundfish bottom trawl fishery of more than 12,000 Chinook in either 2007 or 2008 or would the average bycatch in the 2005–08 period exceed 9,000 fish?

Using these criteria in a quantitative fashion, however, is not possible because no methods are available to predict the number of Chinook salmon that will be caught in either fishery. For example, the bycatch rate varies independently from the amount harvested and, as discussed in the supplemental biological opinion, is likely influenced by the interaction between ocean conditions and fishery response in terms of fishing strategy. Instead, the alternatives can be evaluated qualitatively based on the inclusion of management measures that may directly or indirectly mitigate the bycatch of Chinook salmon. The supplemental biological opinion discusses a number of management measures that should be adopted as part of this harvest specifications process to mitigate Chinook bycatch. These include:

- For the whiting fishery, implement a hard bycatch limit that would couple a four-year running average of 11,000 with a year-specific cap of 14,000 or some similar construction. Under such a limit, the bycatch may be as high as 14,000 in any one year, but would also be constrained such that the average bycatch in the current year and previous three years may not exceed 11,000.

- For the whiting fishery, authorize inseason action to immediately close fishing for whiting shoreward of 100 fm if and when NMFS determines that Chinook bycatch is likely to exceed the 11,000 fish threshold.

It should be noted that establishing the harvest specification and management measures for the whiting fishery is a separate although related action that occurs on an annual basis. For example, the development of harvest specifications and management measures for the 2007 whiting fishery will occur during the March–April 2007 time frame in the Council process. Therefore, these types of management measures are not considered for adoption as part of the proposed action evaluated in this EIS. Bycatch information for the groundfish bottom trawl sector, gathered through the WCGOP, does not become available inseason as is the case for the whiting fishery; currently they become available in September or October of the following year. Thus, it is not possible to use the current incidental take statement benchmark of 9,000 fish as a trigger for inseason action. Instead, the alternatives can be evaluated based on possible direct or indirect effects of management measures on salmon bycatch. Given the current information on the spatio-temporal distribution of salmon bycatch, the following evaluation criteria are applied:

- Will the alternative likely result in an increase or decrease in the groundfish bottom trawl shoreward of the inner RCA boundary? In the 2005–06 period these boundaries varied seasonally and geographically between either 100 or 75 fm while the seaward boundary varied between 150 and 200 fm. This makes the RCA boundaries a good proxy for a zone where Chinook bycatch is likely to be higher versus a zone where bycatch is likely to be low.

- Will the alternative likely result in an increase or decrease in groundfish bottom trawl effort in the area between Cape Falcon and Cape Mendocino? Current data indicate higher bycatch rates in this region.

- Does the alternative expand the selective flatfish trawl requirement? The supplemental biological opinion notes that this gear type may reduce Chinook salmon bycatch rates, although there is not enough observer data to confirm such an effect. Selective flatfish trawl gear is currently required shoreward of the RCA north of 40°10’ N. latitude, which encompasses the areas with the highest salmon bycatch rates. This requirement may be expanded to the areas south of 40°10’ N. latitude in 2007–08. Although bycatch rates in this region are substantially lower, such a measure could have a modest effect on overall salmon bycatch.

- Is the alternative likely to result in an overall increase or decrease in groundfish trawl effort? Other things being equal (such as the spatio-temporal distribution of effort) reductions in overall fishing effort are likely to result in less salmon bycatch. Currently, it is not possible to predict fishing effort directly. As noted above, catch, which is projected in the modeling of alternatives, can be used as a gross proxy for fishing effort. Although the least precise, this criterion is the most concrete tool for evaluating effects because it employs one of the few metrics for which projected estimates are available.

5.3 Discussion of Direct and Indirect Impacts

5.3.1 Harvest Limits (OY Alternatives)

Chapter 2 describes two sets of harvest limit alternatives, the rebuilding alternatives and the 2007–08 OY alternatives. The rebuilding alternatives principally serve a heuristic function; there is no expectation that any one of them would by itself be chosen as the set of harvest limits (in combination with target species OYs) for the 2007–08 period. Nonetheless, they deserve discussion because they provide a high degree of contrast in terms of overall strategy and as a consequence the overall distribution of fishing. As discussed above, the timing and geographic distribution of fishing are two factors that have a demonstrable relation to salmon bycatch. Furthermore, the general distribution of depleted species indirectly affects the distribution of fishing effort because management measures are crafted to discourage fishing in times and areas where incidental catch of these species is likely to be higher. Section 2.1.1.2 describes the effect of the alternatives on regional and sectoral fishing opportunity, which is used below to describe the likely effect on the incidental take of Chinook salmon.

The status quo rebuilding alternatives comprise depleted species OYs based on estimated 2005 harvests projected forward to account for changes in exploitable biomass. The distribution of fishing effort is thus likely to be similar as occurred in 2005–06. Although the resulting incidental take of Chinook salmon cannot be predicted, in 2007-08 it is likely to be within the range of incidental take experienced in the recent past. Depending on what mitigation measures are adopted, the consultation standards discussed above could be exceeded in the whiting and bottom groundfish fishery sectors.

Rebuilding alternative 1 would result in an increase in slope and midwater trawl fishing opportunities. Subject to target species harvest limits this alternative would result in more fishing opportunity in the whiting fishery; however, more fishing effort would occur offshore. This could reduce the incidental take of Chinook salmon in comparison to the status quo.

Rebuilding alternative 2 would result in higher southern shelf fishing opportunities, and close to status quo fishing opportunity for northern bottom and midwater trawl sectors. This alternative could result in increased incidental take of Chinook salmon in comparison to status quo if fishing effort increases on the southern shelf.

Rebuilding alternative 3 would result in higher shelf fishing opportunities coastwide and also higher slope and midwater fishing opportunities. This alternative could result in increased incidental take of Chinook salmon in comparison to status quo and alternatives 1 and 2. Absent mitigation measures, there would be an increased risk of exceeding the consultation thresholds for both the whiting and groundfish bottom trawl fisheries.

Rebuilding alternative 4 would dramatically lower northern shelf fishing opportunities while also constraining southern shelf fisheries north of Point Conception. It would allow increased slope and midwater trawl opportunities. This alternative could result in lower incidental take of Chinook salmon in comparison to status quo and alternatives 1–4 because of the reduction in shelf fishing opportunity.

Rebuilding alternative 5 would dramatically lower shelf, slope, and midwater fishing opportunities coastwide. This alternative could result in the lowest incidental take of Chinook salmon in comparison to all of the other rebuilding alternatives.

The 2007–08 ABC/OY alternatives include the No Action alternative, which would establish the same OYs that were established for 2005–06, six action alternatives, and the Council-preferred alternative, which as of this writing has not been fully specified. No one of the six action alternatives (Alternatives 2–5) is by itself a viable alternative; they function to capture ranges of OYs for each of the stocks or stock complexes. Thus, in Table 2–5 it is possible to read across by row to see these ranges but reading down any one column for an alternative does not result in a meaningful set of OYs across all stocks. For depleted species several intermediate values are presented, which are related to possible long-term rebuilding targets. In addition, and again more as a heuristic device, the low end of the ranges for depleted species is zero, in order to demonstrate the overall effect of rebuilding in the shortest possible time period. Finally, as of this writing the Council-preferred alternative contains a generally more restricted range of OYs for depleted species; final action by the Council will determine the specific OY for each of these stocks. Given this structure of the OY alternatives, it is not possible to simply compare each of the six action alternatives against each other or with the No Action or Council-preferred alternatives. For this reason, the discussion below focuses on the No Action alternative, the effects of rebuilding in the shortest time possible (establishing zero OYs for depleted species), and the low and high range for depleted species in the Council-preferred alternative. Although OYs are ranged for target species, these differences are not likely to have a discernable effect on Chinook salmon at the level of analysis possible in the EIS. The one possible exception is the OY for Pacific whiting. However, selecting an OY for Pacific whiting is not part of the proposed action. A maximum likely range of potential OYs, based on the recent past, is included within the OY alternatives primarily as an aid for forecasting possible impacts to depleted species and revenue projection for the groundfish fisheries as a whole. The effects of differences in the magnitude and distribution of fishing effort related to this range of the potential Pacific whiting OY is likely to be slight, considering other mitigation factors, such as strategies to minimize depleted species bycatch and mitigation measures that may be implemented to reduce Chinook salmon bycatch (see below).

The No Action alternative would continue 2005–06 OYs into the next biennium. They would be implemented along with existing management measures, thus resulting in fishing opportunity experienced in the current biennium. Chinook incidental take would likely be similar to the recent past.

Any alternative that sets the OYs for one or more depleted species to zero or near zero would have a variable effect, depending on which depleted species harvests are so constrained. Table 2–4 shows the projected total catch of depleted groundfish species across groundfish sectors in 2006. Note that the non-tribal whiting fisheries are operating under a total catch limit (cap) for canary and widow rockfish. The principal depleted species caught in the Pacific whiting fishery are canary, darkblotched, and widow rockfish, and POP, although in much smaller quantities than the bottom trawl sector as a whole. Further constraints on harvest limits for these species, moving toward zero, would first tend to change fishing behavior in order to avoid bycatch and at still lower levels require reductions in the target species quota to minimize bycatch. The response in terms of fishing behavior, and resulting effects on Chinook incidental take would depend on which species were constrained. Darkblotched rockfish and POP are shelf species, so avoidance strategies could involve moving closer inshore, and/or a change in fishing strategy, for example from the DTS fishery to targeting flatfish. This could increase the risk of

Chinook take. Widow rockfish are semi-pelagic but favor rocky outcrops on the shelf while canary rockfish although in both cases there distribution can be variable. For that reason there may be a less clear cut changes in fishing strategy associated with low or no OY for these species, and thus less effect on Chinook incidental take. The depleted bocaccio stock and cowcod are principally encountered in central and southern California waters and thus eliminating catch of these species would principally affect bottom trawl fisheries in those areas while the whiting fishery would be largely unaffected. Changes in Chinook incidental take would therefore likely be minimal. Obviously, setting zero OYs for all depleted species would likely require closure of most, if not all, groundfish fisheries (and other fisheries with groundfish incidental catch). In that case incidental take of Chinook salmon would be effectively eliminated.

The Council's preliminary preferred low OY alternative would establish depleted species OYs well below the projected 2006 catch of these species shown in Table 2–4. If all were adopted it would be necessary to severely constrain all groundfish fisheries or selectively close certain sectors. The preliminary preferred high OY alternative are, with the exception of the canary and yelloweye rockfish OYs, above projected 2006 catches. The management measure alternatives have been developed to fall within the range of these OYs in terms of projected depleted species catch. Therefore, the projected catches under these alternatives, discussed below, combined with any mitigating measures identified, provide a clearer picture of the likely impacts of the proposed action on Chinook salmon.

Target species OYs also have some influence on fishing opportunity, although less so than the constraining OYs of the depleted species. In particular, the OY for Pacific whiting is relevant to Chinook take in the whiting fishery. Selection of this OY, and associated management measures, is not part of the proposed action, but a range of possible OYs, represented by the values under alternatives 1 and 2 are presented for analytical purposes. Subject to constraints imposed by depleted species OYs, particularly canary and widow rockfish, a higher Pacific whiting OY would allow greater fishing opportunity in this sector, contributing to the potential for Chinook salmon incidental take.

5.3.2 2007–08 Management Measure Alternatives

Management measure alternatives can affect Chinook bycatch in two ways. First, for the groundfish bottom trawl sector trip limits and other management measures can affect the overall amount of fishing effort. This is not an issue in the whiting fishery, because target catch is managed by quota. But the size of total catch limits (bycatch caps) for selected depleted species, as were applied in 2005–06, could act as constraint on overall fishing effort if they force early closure of the fishery. Second, depending on the mix of trip limits, and for the whiting fishery bycatch caps, fishing behavior in terms of timing and location could be affected.

As discussed in the supplemental biological opinion and in Section 5.1, historically there has been no clear correlation between fishing opportunity, harvest and Chinook take in the whiting fishery. Similarly, the limited data available from the groundfish bottom trawl sector show a large difference between the 2002–03 estimates and the 2004 estimate that cannot be obviously correlated with characteristics of the fishery in those years. The 2007–08 management measure alternatives have been structured to meet the range of preliminary preferred OY alternatives identified by the Council. It is not possible to predict any differential effect of the management measure alternatives in terms of Chinook take. Take is likely to be consistent with levels experienced in the recent past, with some unquantified likelihood that the consultation standards established for the two sectors could be exceeded during the 2007–-08 period. Additional mitigation measures, discussed below, could be implemented to address the risk of higher Chinook take.

Although not part of the proposed action, the adoption of additional mitigation measures to reduce

Chinook incidental take in the whiting fishery could be considered when establishing management measures for that fishery. This a separate, connected action that occurs in March of each year based on the most recent annual stock assessment for Pacific whiting. Thus, for 2007, the Council will take action to adopt a whiting OY and appropriate management measures at their March 2007 meeting.

For 2007 and beyond, automatic action authority could be established under 50 CFR 660.370 (d) to implement an Ocean Salmon Conservation Zone, as discussed in Section 5.1.1 in relation to the 2005 and 2006 seasons, for the whiting fishery in response to high salmon take. When NMFS projects the catch of Chinook salmon in the Pacific whiting fishery will exceed the 11,000 fish threshold, the Ocean Salmon Conservation Area could be put in place for all sectors of the whiting fishery though a single Federal Register notice.

As needed to stay within the available OY for overfished species, each of the management alternatives other than status quo could contain additional depth closures or provisions to create additional closures that are imposed on the whiting fishery mid-season, if an Ocean Salmon Conservation Area becomes effective. Shifts in fishing effort between 100 and 150 fm may need to be restricted under some alternatives.

There remains considerable uncertainty about bycatch of salmon in the bottom trawl fishery. The magnitude and distribution of bycatch in the trawl fishery since 2002 has been affected by significant changes in management measures to protect overfished groundfish stocks and changes in fishing effort as a result of the trawl buyback program. The uncertainty will remain until more years of observer data are available and changes in groundfish fishery management and effort distribution are analyzed in relation to the incidental take of salmon. Until 2005 observer data are available and can be analyzed, and until coded wire tag data is analyzed in relation to observer data and listed stocks, maintaining the seaward line of the Trawl RCA between Cascade Head (45° 03.83' N. lat.) and the north/south management line (40° 10.00' N. lat.) at 250 fm for the winter periods (January-April and November-December) would be a precautionary measure that could be taken in 2007 to reduce the incidental take of Chinook salmon in the bottom trawl fishery.

5.4 Discussion of Cumulative Impacts

"Cumulative impact" is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)

Based on this definition, this section briefly identifies two categories of actions that have effects that when combined with the effects of the proposed action, could result in significant impacts to ESA-listed Chinook salmon. First are actions occurring in the past or the present (which is defined as the period through December 31, 2006) that will have effects persisting into the period when the proposed action is implemented (i.e., January 1, 2007) and possibly beyond. Second are reasonably foreseeable effects, which will be implemented on or after January 1, 2007 and combine with the direct and indirect effects of the proposed action to produce potentially significant cumulative effects. Section 5.5 then describes the overall or cumulative effect on protected species resulting from the direct, indirect, and external effects on protected species.

Past and present actions with persistent effects:

- Groundfish harvest specifications and management measures, 1998-2006: Past management measures authorized fishing, indirectly affecting the incidental take of Chinook salmon, as described in Section 5.1. The 1998–2006 period is identified because it marks a substantial reduction in groundfish harvest limits in comparison to earlier years. During this period rebuilding plans were developed and adopted for depleted groundfish species. Selection of a rebuilding strategy for each stock narrows the range of OYs that may be chosen for those stocks and has required the implementation of various constraining management measures to limit catches of these stocks. Given the life cycle of Chinook salmon, fishing mortality in more recent years would have a much greater contributory effect on population status.

- West Coast non-groundfish fisheries: Commercial and recreational salmon fisheries target non-listed salmon but incidentally take listed Chinook. All fisheries have a similar persistent effect, contributing to total fishing mortality and attendant effects on stock productivity. Commercial and recreational salmon fisheries are managed to optimize harvest of hatchery-produced fish while keeping the take of wild, ESA-listed stocks within limits that will ensure their continued existence. Thus, in managing these stocks, all sources of fishing mortality are estimated or accounted for, including incidental take in groundfish fisheries.

- Nonfishing actions: Salmon are vulnerable to human-caused degradation of freshwater habitat used for spawning. These effects are generally well known and diverse. They include physical barriers to migration (dams), changes in water flow and temperature (often a secondary effect of dams or water diversion projects), and degradation of spawning environments due to increased silt in the water due to adjacent land use. A very large proportion of the long-term, and often permanent, declines in salmon stocks is attributable to this class of impacts. For a detailed summary of nonfishing impacts to salmon habitat see Section 3.2.5 of the EFH Appendix in Amendment 14 to the Pacific Coast Salmon FMP.

Reasonably foreseeable future actions:

- Groundfish harvest specifications and management measures, 2009–10 and beyond: As with past harvest specifications, future harvest specifications are likely to have an indirect effect on the incidental take of listed Chinook salmon, which in combination with incidental take during 2007–08 will have cumulative effects on year classes intercepted by the fisheries during that time. This cumulative effect will only persist as long as the affected year classes. For 2007–08 harvest specifications and management measures this is of relatively short duration. Projected rebuilding times for depleted species are much longer and rebuilding alternative are thus likely to affect groundfish harvest levels, and thus indirectly incidental take of Chinook salmon, for decades. However, it is likely that rebuilding strategies will continue to be modified in the future based on new information, so it is probably unrealistic to expect that any strategy adopted as part of this proposed action will remain unchanged for the duration of a given rebuilding period. Nonetheless, in very general terms groundfish fishing effort is likely to constrained to mitigate depleted species catch for the foreseeable future.

- West Coast non-groundfish fisheries: Similar to groundfish fisheries, future take in non-groundfish fisheries (i.e., on or after January 1, 2007) contributes to year-class-specific total fishing mortality.

- Non-fishing actions: Adverse impacts to freshwater habitat are likely to continue for the foreseeable future.

5.5 Summary of Impacts

5.5.1 Harvest Limits (OY Alternatives)

This section is intended summarize in comparative fashion the overall impact of each of the alternatives considering both direct and indirect impacts and the effects of other past, present, and reasonably foreseeable future actions. Previous harvest specifications and harvest specifications established in periods beyond the next biennium are likely to have a modest or negligible effect on total fishing mortality for a given Chinook stock year class or cohort over and above the direct and indirect effects of fishing in 2007–08. This is because Chinook salmon are relatively short-lived species so the year classes intercepted in 2007–08 would only experience fishing mortality from groundfish fisheries in the bienniums immediately preceding and following 2007–08. Furthermore, most of the Chinook taken in the groundfish trawl fisheries are 2-year olds; mortality on this age class has less effect on stock productivity than the removal of mature fish.

Modification of rebuilding plans has a long-term effect on fishing opportunity because adopted targets determine harvest levels in future years. As stocks rebuild constraining OYs for depleted species will increase, allowing more fishing opportunity. However, it is not possible to predict what effect this will have on Chinook take.

As discussed above, in-river habitat modifications affecting reproductive success and fishing mortality in other fisheries have a large cumulative effect on Chinook salmon. Generally, these effects are assessed through Council management of directed harvest of non-listed salmon and other processes at the state and federal level.

It is not possible to distinguish how the various actions described above would interact differentially with the alternatives to produce relatively different effects in comparison to the description of direct/indirect effects described in Section 5.3.1.

5.5.2 2007–08 Management Measure Alternatives

As with the OY alternatives, there is no information to indicate how other actions contributing to cumulative effects might combine with indirect/effects to produce relative differences in effects among the alternatives.

6.0 DESCRIPTION OF THE FISHERIES MANAGEMENT REGIME

6.1 Management Data Systems

This chapter addresses policy, science, and management entities directly affected by changes to the current management regime, but does not include participants in the fishery or the fishing communities of the West Coast (see Chapter 7 for a description of the socioeconomic environment). The management regime is an important issue because it generates direct and indirect impacts. The regime is also itself affected by changes in law and policy, which can cumulatively affect the environment. This section describes stock assessments, catch accounting, observer programs and research fisheries, all crucial components in the process of determining sustainable fishery yields; uncertainty, which underlies the range of alternatives evaluated in this EIS; and enforcement, which affects the efficacy of prescribed management measures. Impacts, considered in terms of public sector costs, are evaluated in Chapter 7.

Uncertainty in fishery management and constraining OYs combine to create a potentially intensive inseason management burden on the management regime. As discussed in this chapter, ongoing research, existing observer programs, and revised fishery sampling programs could provide new information during the 2006-2007 management cycle. Entities and documents including the Pacific Coast Groundfish FMP, the Council and its Ad Hoc Groundfish Information Policy Committee, and NEPA all provide rules and guidance on inseason use of new information.

6.1.1 Catch Monitoring and Accounting

Various state, federal, and tribal catch monitoring systems are used in West Coast groundfish management. These are coordinated through the Pacific States Marine Fisheries Commission (PSMFC). PacFIN (Pacific Fisheries Information Network) is the commercial catch monitoring database, and RecFIN (Recreational Fishery Information Network) is the database for recreational fishery catch monitoring. There are two components to total catch, (1) catch landed in port, and (2) catch discarded at sea. Discards occur for regulatory reasons (i.e., catch in excess of trip and/or landing limits) and market reasons (i.e., catch of unmarketable species or size). A description of the relevant data systems used to monitor total catch and discards in commercial, recreational, and research fisheries follows. A description of how these data sources are used in modeling fishery impacts see Section 4.5.

6.1.1.1 Monitoring Commercial Landings

Sorting requirements are now in place for all species with trip limits, harvest guidelines, or OYs, including all depleted species. This provides accounting for the weight of landed depleted species when catches are hailed at sea or landed. Limited entry groundfish trawl fishermen are also required to maintain logbooks to record the start and haul locations, time, and duration of trawl tows, as well as the total catch by species market category (i.e., those species and complexes with sorting requirements). Landings are recorded on state fish receiving tickets. Fishtickets are designed by the individual states, but there is an effort to coordinate record-keeping requirements with state and federal managers. Poundage by sorted species category, area of catch, vessel identification number, and other data elements are required on fishtickets. Landings are also sampled in port by state personnel to collect species composition data, otoliths for ageing, lengths, and other biological data. Sample rates vary between fishery and state, but there is an effort to sample about 20% of the landed catch. A suspension of at-sea sorting requirements coupled with full retention of catch is allowed in the whiting fishery (by FMP Amendment 10 and an annual EFP in the Shoreside Whiting sector). The at-sea whiting fishery has 100% on-board observer coverage, while the shoreside whiting sector brings most of their catch to port for sampling. Landings, logbook data, and state port sampling data are reported inseason to the

PacFIN database managed by the PSMFC (www.psmfc.org/pacfin/index.html). The GMT and PSMFC manage the Quota Species Monitoring (QSM) dataset reported in PacFIN. All landings of groundfish stocks of concern (depleted stocks and stocks below BMSY) and target stocks and stock complexes in West Coast fisheries are tracked in QSM reports of landed catch. The GMT recommends prescribed landing limits and other inseason management measures to the Council to attain, but not exceed, total catch OYs of QSM species. Stock and complex landing limits are modified inseason to control total fishing-related mortality; QSM reports and landed catch forecasts are used to control the landed catch component.

6.1.1.2 Monitoring Recreational Catch

Recreational catch is monitored by the states as it is landed in port. These data are compiled by the PSMFC in the RecFIN database. The types of data compiled in RecFIN include sampled biological data, estimates of landed catch plus discards, and economic data. Descriptions of the RecFIN program, state recreational fishery sampling programs in Oregon and Washington, and the most recent data available to managers, assessment scientists, and the general public, can be found on the PSMFC web site at www.psmfc.org/recfin.

The Marine Recreational Fisheries Statistics Survey (MRFSS) has been an integral part of the RecFIN program. Traditionally, there are two primary components of the survey; field intercept surveys (administered under supervision of PSMFC) and a random phone survey of coastal populations (administered by a third party contracted by NMFS). The field intercept surveys was used to estimate catch, and the phone survey was used to estimate effort. The results of these two efforts are combined in the RecFIN data system maintained by PSMFC, and estimates of total effort and fishing mortality are produced along with other data potentially useful for management and stock assessments. However, MRFSS was not designed to estimate catch and effort at the level of precision needed for management or assessment; it was designed to provide a broad picture look of national fisheries. Comparison with independent and more precise estimation procedures has shown wide variance in catch estimates. Inseason management of recreational fisheries using MRFSS has been compromised by inseason variance of catch estimates.

In recent years, efforts have been made to improve MRFSS. Observing a growing concern with the use of MRFSS program data on the West Coast, California and policy representatives from the West Coast recommended the development of a new program to replace MRFSS. In response, staff from the CDFG and the PSMFC designed the California Recreational Fisheries Survey (CRFS), a new program for sampling California's recreational fisheries which incorporated both the comprehensive coverage of the MRFSS program and the high frequency on-site sampling of CDFG's Ocean Salmon Project. Additionally, in 2001 PSMFC, with support from NMFS, began a new survey to estimate party/charter boat (CPFV) fishing effort in California.

Washington and Oregon use the MRFSS system as a supplement to their extensive port sampling programs from which most of their recreational catch estimates are derived. The Washington Ocean Sampling Program and the Oregon Boat Survey both operate annually from approximately April through October and focus on recreational finfish (including salmon, groundfish, halibut, and tuna) from private and charter fishing vessels.

A primary goal of West Coast recreational survey programs is to produce timely marine recreational, fishery-based data needed for sustainable management of marine recreational fishery resources. Continuing improvements to West Coast recreational fishery surveys should reduce uncertainty in recreational harvest estimates and improve preseason and inseason management processes, two important components of coastwide groundfish fishery management under constraining OYs.

6.1.1.3 Management Response to Catch Monitoring

Management measures are normally imposed, adjusted, or removed at the beginning of the biennial fishing period, but may, if the Council determines it necessary, be imposed, adjusted, or removed at any time during the period. As described in Section 6.2 of the Groundfish FMP, four different categories of management actions are authorized, ranging from automatic actions initiated by NMFS to full rulemaking actions requiring a minimum of two Council meetings. Inseason adjustments typically fall under the category of notice actions that are routine (as defined by the FMP) in nature and usually require one Council meeting and one *Federal Register* notice. Federal and/or state responses to management goals varies according to the specification of the harvest targets and are largely governed by the definitions in the FMP and federal regulations as follows:

> <u>Acceptable Biological Catch (ABC)</u> *is a biologically based estimate of the amount of fish that may be harvested from the fishery each year without jeopardizing the resource. It is a seasonally determined catch that may differ from MSY for biological reasons. It may be lower or higher than MSY in some years for species with fluctuating recruitment. The ABC may be modified to incorporate biological safety factors and risk assessment due to uncertainty. Lacking other biological justification, the ABC is defined as the MSY exploitation rate multiplied by the exploitable biomass for the relevant time period.*
>
> <u>Optimum yield</u> *means the amount of fish which will provide the greatest overall benefit to the U.S., particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems, is prescribed as such on the basis of the maximum sustainable yield from the fishery as reduced by any relevant economic, social, or ecological factor; and in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery (Federal regulations adds final sentence: OY may be expressed numerically (as a harvest guideline, quota, or other specification) or non-numerically).*
>
> <u>Quota</u> *means a specified numerical harvest objective, the attainment (or expected attainment) of which causes closure of the fishery for that species or species group. Groundfish species or species groups under this FMP for which quotas have been achieved shall be treated in the same manner as prohibited species*
> *(the second sentence is not included in Federal Regulations).*
>
> <u>Harvest guideline</u> *is a specified numerical harvest objective which is not a quota. Attainment of a harvest guideline does not require closure of a fishery. (Identical language in Federal Regulations 50 CFR Part 660, Subpart G).*

California

California has three possible courses of regulatory action for recreational fisheries when a harvest limit is reached.

1. Closure of recreational fisheries for any federal groundfish, greenlings (of the genus *Hexagrammos*), California sheephead, and ocean whitefish when a federal annual harvest limit for lingcod, rockfish, cabezon, or a subgroup of rockfish, and/or California scorpionfish has been exceeded or is projected to be exceeded (Section 27.82 of Title 14, California Code of Regulations).

The CFGC has given CDFG the authority to close the following recreational fisheries when an annual harvest limit (OY or harvest guideline) established in regulation by NMFS for lingcod, rockfish, cabezon, or a subgroup of rockfish, and/or California scorpionfish has been exceeded or is projected to be exceeded: lingcod, rockfish, a subgroup of rockfish, California scorpionfish, cabezon, greenlings (of the genus *Hexagrammos*), California sheephead, ocean whitefish, and any federal groundfish. Closures may encompass all state waters or specific areas, and may be for all or part of the calendar year. The CDFG must provide the public with a notice of the closure (via press release) at least 10 days before the closure is to take effect.

2. Closure of recreational fisheries for California sheephead, cabezon or greenlings (of the genus *Hexagrammos*) when a state-established total allowable catch (TAC) or allocation is reached or is projected to be reached (Section 52.10 of Title 14, California Code of Regulations).

Statewide TACs are established in regulation for California sheephead, cabezon, or greenlings (of the genus Hexagrammos). The regulation sets allocations for recreational and commercial fisheries. CFGC has given the CDFG the authority to close the recreational and commercial fisheries for these species when an allocation or TAC is reached or is projected to be reached prior to the end of the calendar year. For the closure of a recreational fishery, CDFG is required to provide the public with at least 10 days notice (via press release) prior to the closure.

3. Emergency action by CFGC (Section 240 of the Fish and Game Code).

The California State Legislature has authorized CFGC to adopt or repeal regulations on an emergency basis, provided the action is necessary for (1) the immediate conservation, preservation, or protection of birds, mammals, reptiles, or fish, including, but not limited to, any nests or eggs thereof, or (2) the immediate preservation of the public peace, health and safety, or general welfare. CFGC may adopt emergency regulations for recreational fisheries and for those commercial fisheries the Legislature has given CFGC the authority to regulate.

The law requires CFGC hold at least one hearing before taking emergency action, and the action is subject to the review of the Office of Administrative Law (OAL). Once CFGC takes action and submits the rulemaking file to OAL, OAL has 10 days to review the file and approve or disapprove the regulation. If OAL approves the regulation, then it is filed with the Secretary of State and is in effect for 120 days (unless the regulation specifies a shorter time period).

Emergency regulation lapses by operation of law unless CFGC files a completed rulemaking for a permanent regulation with OAL or OAL approves a re-adoption of the emergency regulation. The rulemaking for the permanent regulation must follow the normal rulemaking provisions of the Administrative Procedures Act. This includes a 45-day public notice.

Oregon

The Oregon State Legislature granted the Oregon Fish and Wildlife Commission (OFWC) the authority to adopt regulations under the Oregon Administrative Rules (OAR). The OFWC delegates the authority to adopt temporary rules to the Director of ODFW (Director). Temporary rules may be considered for various reason, including the achievement of quotas, optimum yields, harvest limits or harvest guidelines, and to conform to federal regulations. Temporary regulations can be adopted, filed and in effect within a single business day, but in practice, 72 hours public notice is usually provided. A temporary rule approved by the Director is ratified by the OFWC at its next meeting, usually within 30 days.

Once filed, copies of the temporary rule are distributed to all marine related ODFW and Oregon State Police offices. The ODFW information and education program creates and distributes a general public news release. Additionally, specific industry notices are developed distributed throughout local fishing communities.

Once adopted, temporary regulations are in effect for 180 days. If the regulations needs to remain in place for a longer duration, ODFW can adopt a permanent rule through the full OFWC process. This two-meeting process includes public notice of the intent for rulemaking, an economic analysis, and adequate public review.

Washington

The Washington State Legislature has granted the Washington Fish and Wildlife Commission (WFWC) the authority to adopt emergency regulations under the Revised Code of Washington (RCW) 77.04.090. WFWC has delegated the authority to adopt emergency regulations to the Director of WDFW. Emergency regulations may be considered for various reasons, including the achievement of quotas, optimum yields, harvest limits or harvest guidelines, and to conform with federal regulations. The parameters for approving emergency regulations are not specified in the authority language. Emergency regulations can be adopted, filed, and in effect within 24 hours of being drafted.

Once adopted, emergency regulations are in effect for 120 days. During this time, if the regulation needs to remain in place for a longer duration, WDFW may consider adopting a permanent rule. Depending on the nature of the rule, it may have to go through the WFWC approval process. Once the permanent rule process has been initiated, a second emergency regulation may be filed to extend the time period. For example, an emergency regulation filed on March 1 that must remain in effect for the calendar year would expire on June 28. Provided a permanent rule process has been initiated, a subsequent emergency regulation can be filed on June 29 that would remain in effect through October 26, in order to accommodate the time needed for the permanent rule process to be finalized.

Washington Administrative Code (WAC) 220-28-010 strengthens state's the ability to enforce emergency regulations, by stating, "It shall be unlawful to take, fish for or possess food fish or shellfish taken contrary to the provisions of any special season or emergency closed period prescribed in this chapter." A note at the end of the rule language also clarifies, "The department of fish and wildlife frequently adopts emergency rules of limited duration that relate to seasons, closures, gear, and other special matters concerning the industry...."

Once filed, copies of the emergency regulation are faxed to all WDFW regional offices and enforcement staff. WDFW also uses its Outreach and Education Program to inform the public of emergency regulations. Typically, a Fishing Rule Change Notice is distributed to local media and WDFWs sportfishing hotlines are updated within 24 hours of the rule adoption.

6.1.2 Standardized Bycatch Reporting Methodologies

Establishing a standardized bycatch reporting methodology and limiting bycatch to the extent practicable are MSA mandates. Effective bycatch accounting and control mechanisms are also critical for staying within target total catch OYs. The first element in limiting bycatch is accurately measuring bycatch rates by time, area, depth, gear type, and fishing strategy. This section describes West Coast programs designed to achieve these goals.

At its November 2005 meeting, the Council approved Amendment 18 to the Groundfish FMP. The Council recommendation addresses National Standard 9 and Section 303(a)(11) of the MSA, which require practicable means to minimize bycatch and bycatch mortality a standardized bycatch reporting methodology. The purpose of FMP Amendment 18 is to clearly and comprehensively describe measures that address these requirements, which have been established through long-term regulations and the biennial management process. The amendment also describes new measures that could be implemented by future regulatory or amendment actions. For additional information on Amendment 18 see the Council web page (www.pcouncil.org/groundfish/gffmp/gfa18.html).

6.1.2.1 West Coast Groundfish Observer Program

The WCGOP includes the Observer Team and collaborators from the PSMFC that direct the program, train new observers, and manage and analyze the bycatch data. On May 24, 2001, NMFS established the WCGOP to implement the *Pacific Coast Groundfish Fishery Management Plan* (50 CFR Part 660). This regulation requires all vessels that participate in commercial groundfish fisheries to carry an observer when notified to do so by NMFS or its designated agent. These observers monitor and record catch data, including species composition of retained and discarded catch. Observers also collect critical biological data such as fish length, sex, and weight. The program currently deploys observers coastwide on the permitted trawl and fixed-gear groundfish fleet, as well as on some vessels that are part of the open-access groundfish fleet.

The WCGOP is designed to provide estimates of fleet-wide discards in commercial fisheries; fishtickets are the mandated landings accounting mechanism. Logbook data need to be available to fully use observer data because observers initially record hail weights and logbook data for retained catch, and these values need to be adjusted by fishticket information to achieve total catch estimates. One difficulty is the need for a statistically significant number of observations of discard across all strata to determine representative bycatch rates for these strata. Implementation of depth-based management further exacerbated the data-sparseness of observations, since areas where many observations occurred in the first year of the WCGOP are now closed to fishing.

NMFS first implemented the WCGOP in August 2001 to make direct observations of commercial groundfish discards. Given the skewed distribution of bycatch in West Coast groundfish fisheries, many observations in each sampling strata (i.e.,target effort by gear type by area) are needed to estimate representative bycatch rates of depleted groundfish species. The seasonality of bycatch is an important management consideration. Target opportunities for healthy flatfish and DTS species vary seasonally and geographically. It is reasonable to expect bycatch rates of depleted groundfish species to vary in accordance with the co-occurrence of target species and depleted species.

The he WCGOP has released annual reports beginning in 2003 which describe the analysis of observer data for various fishery sectors and species collected under the program. These reports and background materials on the WCGOP are available on the Northwest Fisheries Science Center website at: www.nwfsc.noaa.gov/research/divisions/fram/observer/datareport/index.cfm.

NMFS continually reviews the program and has gradually expanded the programs coverage since its inception. Additionally, the NWFSC has worked closely with the Council and NMFS-NWR to coordinate the availability of WCGOP results into the management regime. A description of how data from the WCGOP is being used in the modeling of commercial fishery impacts can be found in Section 4.5.

6.1.2.2 At-Sea Pacific Whiting Observer Program

To increase the utilization of bycatch otherwise discarded as a result of trip limits, Amendment 13 to the Groundfish FMP implemented an increased utilization program on June 1, 2001, which allows catcher/processors and motherships in the whiting fishery to exceed groundfish trip limits without penalty, providing specific conditions are met. These conditions include provisions for 100% observer coverage, non-retention of prohibited species, and either donation of retained catch in excess of cumulative trip limits to a bona fide hunger relief agency or processing of retained catch into mince, meal, or oil products.

Vessels participating in the at-sea Pacific whiting fisheries have been carrying observers voluntarily since 1991. NMFS made observer coverage mandatory for at-sea processors in July 2004 (65 FR 31751). These provisions have not only given fishery managers the tools necessary to allow the At-Sea Pacific Whiting Program to operate efficiently while meeting management goals, but have also provided scientists, through the observer coverage, an extensive amount of information on bycatch species. This dataset has not only provided valuable information in the management of Pacific whiting, but has also been used as a stock assessment data source.

6.1.2.3 Shore-based Pacific Whiting Observation Program

The Shoreside Hake Observation Program (SHOP) was established in 1992 to provide information for evaluating bycatch in the directed Pacific whiting fishery and for evaluating conservation measures adopted to limit the catch of salmon, other groundfish, and prohibited species. Though instituted as an experimental monitoring program, it has been continued annually to account for all catch in targeted whiting trip landings, enumerate potential discards, and accommodate the landing and disposal of non-sorted catch from these trips. Initially, the SHOP included at-sea samplers aboard shore-based whiting vessels. However, when an ODFW analysis of bycatch determined no apparent difference between vessels with and without samplers, sampler coverage was reduced to shoreside processing plants. In 1995, the SHOP's emphasis changed from a high observation rate (50% of landings), to a lower rate (10% of landings), and increased emphasis on collection of biological information (e.g., otoliths, length, weight, sex, and maturity) from Pacific whiting and selected bycatch species (yellowtail rockfish, widow rockfish, sablefish, chub (Pacific) mackerel (*Scomber japonicus*), and jack mackerel (*Trachurus symmetricus*). The required observation rate was decreased as studies indicated that fishtickets were a good representation of what was actually landed. Focus shifted again due to 1997 changes in the allocation of yellowtail rockfish and increases in yellowtail bycatch rates. Since then, yellowtail and widow bycatch in the shoreside whiting fishery has been dramatically reduced because of increased awareness by fishermen of the bycatch and allocation issues involved in the SHOP program.

The SHOP is a cooperative effort between the fishing industry and state and federal management agencies to sample and collect information on directed Pacific whiting landings at shoreside processing plants. Participating vessels apply for and carry an EFP issued by NMFS. Permit terms require vessels to retain all catch and land unsorted catch at designated shoreside processing plants. Permitted vessels are not penalized for landing prohibited species (e.g., Pacific salmon, Pacific halibut, Dungeness crab), nor are they held liable for overages of groundfish trip limits. For additional information and complete reports go to: www.dfw.state.or.us/MRP/hake/.

Since inception, an EFP has been adopted annually allowing suspension of at-sea sorting requirements in the shore-based whiting fishery enabling full retention and subsequent port sampling of the entire catch. However, EFPs are intended to provide for limited testing of a fishing strategy, gear type, or monitoring program that may eventually be implemented on a larger fleet-wide scale and are not a permanent solution to the monitoring needs of the shore-based Pacific whiting fishery. A permanent monitoring program for the shore-based Pacific whiting fleet is being developed because of the specification in the Pacific Coast Salmon and Groundfish FMPs and the 1992 BO analyzing the effects of the groundfish fishery on salmon stocks listed under the ESA. The issue of salmon retention in the groundfish trawl fisheries was brought before the Council in 1996 in the form of Amendment 10 to the

Pacific Coast Groundfish FMP and Amendment 12 to the Pacific Coast Salmon FMP.

The Council and NMFS are currently working to adopt a monitoring program to provide a full retention opportunity without the use of the EFP process and the Council adopted a preliminary range of alternatives for public review in June 2004. However, a number of issues on how a monitoring program would operate could not be resolved and NMFS worked with the states and industry to prepare a revised range of alternatives for Council consideration. Council action is now scheduled for September and November 2006. If the Council takes final action according to this schedule NMFS will then develop the regulations needed to implement the program in 2007.

6.1.2.4 Central California Marine Sport Fish Project

The CDFG has been collecting angler catch data from the CPFV industry intermittently for several decades in order to assess the status of the nearshore California recreational fishery. The project has focused primarily on rockfish and lingcod angling and has not sampled salmon trips. Reports and analyses from these projects document trends by port area in species composition, angler effort, catch, and, for selected species, CPUE, mean length, and length frequency. In addition, total catch and effort estimates are made based on adjustments of logbook data by sampling information.

Before 1987, catch information was primarily obtained on a general port basis from dockside sampling of CPFVs, also called party boats. This did not allow documentation of specific areas of importance to recreational anglers and was not sufficient to assess the status of rockfish populations at specific locations.

CPFV operators are required by law to record total catch and location for all fishing trips in logbooks provided by the CDFG. However, the required information is too general for use in assessing the status of the multi species rockfish complex on a reef by reef basis. Rockfish catch data are not reported by species and information on location is only requested by block number (a block is an area of 100 square miles). Many rockfishes tend to be residential, underscoring the need for site specific data. Thus, there is a strong need to collect catch information on board CPFVs at sea. However, locations of specific fishing sites are often not revealed for reasons of confidentiality.

In May 1987 the Central California Marine Sport Fish Project began on board sampling of the CPFV fleet. Data collection continued until June 1990, when state budgetary constraints temporarily precluded further sampling, resumed in August 1991, and continued through 1994. The program depends on the voluntary cooperation of CPFV owners and operators. Angler catches on board central and northern California CPFVs were sampled from fourteen ports, ranging from Crescent City in the north to Port San Luis (Avila Beach) in the south. For additional information on this program, see the PSMFC website at: (www.psmfc.org/recfin/ccmsp.htm).

6.1.2.5 Oregon Marine Recreational Observation Program

In response to depleted species declarations and increasing concerns about fishery interactions with these species, ODFW started this program to improve understanding of recreational impacts. There were three objectives to this program; (1) document the magnitude of canary rockfish discard in the Oregon recreational fishery; (2) improve the biological database for several rockfish and groundfish species; and (3) gather reef location information for future habitat mapping. A seasonal sampler was stationed in each of the ports of Garibaldi, Newport, and Charleston to ride recreational groundfish charter vessels coastwide in Oregon from July through September, 2001. The Garibaldi sampler covered boats out of Garibaldi, the Newport sampler covered both Newport and Depoe Bay, and the Charleston sampler covered Charleston, Bandon, and Brookings charter vessels. During a typical day the sampler would ride a five to eight hour recreational groundfish charter trip and spend the remainder of the day gathering biological and genetic data dockside from several rockfish and groundfish species for which little is known mostly due to their infrequency in the catch. When allowed by the captain, the sampler also obtained Global Positioning System (GPS) locations of fishing sites for future use by the Habitat Mapping Project of the ODFW Marine Resources Program. Results from this program have been incorporated into recreational fishery modeling by ODFW. This program has continued and expanded to document the magnitude of discard of all groundfish species, not just canary rockfish. For more information on this program as well as other fishery research and survey programs see the ODFW Marine Program website at: www.dfw.state.or.us/MRP/.

6.1.2.6 WDFW Groundfish At-Sea Data Collection Program

The WDFW At-Sea Data Collection Program was initiated in 2001 to allow fishery participants access to healthier groundfish stocks while meeting the rebuilding targets of depleted stocks and to collect bycatch data through an at-sea sampler program. The data collected in these programs could assist with future fishery management by producing valuable and accurate data on the amount, location, and species composition of the bycatch of rockfish associated with these fisheries, rather than using calculated bycatch assumptions. These data could also allow the Council to establish trip limits in the future that maximize fishing opportunities on healthy stocks while meeting conservation goals for depleted stocks.

In recent years, WDFW has implemented its At-Sea Data Collection Program through the use of federal EFPs. In 2001, 2002, 2003, and 2004, WDFW sponsored and administered a trawl EFP for arrowtooth flounder and petrale sole, and in 2002, WDFW also sponsored a midwater trawl EFP for yellowtail rockfish. The primary objective for these experimental fisheries was to measure bycatch rates for depleted rockfish species associated with these trawl fisheries. Fishery participants were provided access to healthier groundfish stocks and were constrained by individual vessel bycatch caps. State-sponsored samplers were used to collect data on the amount of rockfish bycatch caught on a per tow basis and to ensure the vessel complied with the bycatch cap; therefore, vessels participating in the EFP were required to have 100% sampler coverage. In 2003 and 2004, WDFW sponsored a longline EFP for spiny dogfish that also required 100% sampler coverage to measure the bycatch rate of depleted rockfish species associated with directed dogfish fishing. Research scientists have analyzed the preliminary data from these EFPs and have finalized summary reports.

6.1.2.7. WDFW Ocean Sampling Program

In addition to the At-Sea Data Collection Program, WDFW collects at-sea data through the Ocean Sampling Program. The at-sea portion is not intended to be an observer program for the purposes of enumerating the bycatch alone, but is coupled with shore-based sampling of anglers to calculate an estimated discard weight. At-sea samplers record biological information from discarded species. Shore-based creel surveys of anglers provide the estimate of total number of discards. Combining these two data sources yields estimates of the weight of total fishery discard by species.

6.1.2.8 Tribal Observer Program

Tribal directed groundfish fisheries are subject to full rockfish retention. For some rockfish species where the tribes do not have formal allocations, trip limits proposed by the tribes are adopted by the Council to accommodate incidental catch in directed fisheries (i.e., Pacific halibut, sablefish, and yellowtail rockfish). These trip limits are intended to constrain direct catches while allowing for small incidental catches. Incidental catch and discard of depleted species is minimized through the use of full rockfish retention, shore based sampling, observer coverage, and shared information throughout the fleets regarding areas of known interactions with species of concern. Makah trawl vessels often participate in paired tows in close proximity where one vessel has observer coverage. If landings on the observed vessel indicate higher than anticipated catches of depleted species, the vessels relocate and inform the rest of the fleet of the results (Steve Joner, Makah Fisheries Management, pers. comm., February, 2004). Fleet communication in order to avoid depleted species is practiced by all tribal fleets.

6.1.3 Research Fisheries

The reduction in directed fisheries and overall landings has resulted in less information available to fishery managers compromising efforts to assess stock abundance and recovery. There is an increasing reliance on fishery-independent sources of information such as research fisheries and surveys. This is particularly true for depleted species such as widow rockfish, yelloweye rockfish, cowcod, bocaccio, and canary rockfish as fisheries are designed to avoid areas inhabited by these species. There is a relatively sparse amount of data available for widow rockfish because widow rockfish directed fisheries have been essentially eliminated and the Pacific whiting sectors have modified their behavior to avoid encounters with widow rockfish. Assessment scientists will continue to rely on research fisheries as landings, age composition, and logbook catch rate data from many fishery sources decreases. A summary of long-term research fisheries and resource surveys can be found in Appendix A, Section 1.1.1.3. of the 2005-2006 groundfish harvest specifications FEIS {PFMC, 2004 1127 /id}.

6.1.4 The Stock Assessment Process

The Council process for setting groundfish harvest levels and other specifications depends on periodic assessments of the status of groundfish stocks, rebuilding analyses of those stocks that are depleted and managed under rebuilding constraints, and a report from an established assessment review body or a STAR Panel. As appropriate, the SSC recommends the best available science for groundfish management decision-making in the Council process. The SSC reviews new assessments, rebuilding analyses, and STAR Panel reports and recommends the data and analyses that should be used to set groundfish harvest levels and other specifications for the following biennial management period.

NMFS is currently planning the next round of stock assessments for completion and review in 2007 for use in developing management measures and harvest specifications for the 2009-2010 biennial management cycle. Rebuilding plans and stock assessments for depleted species are subject to review every two years. NMFS will also hold a series of workshops in 2006 focusing on data needs and available data sources for the list of stock assessments being considered for 2007. More information on the stock assessment process can be found in Appendix A, Section 1.1.1.1 of the 2005-2006 groundfish harvest specifications FEIS {PFMC, 2004 1127 /id}.

6.1.5 Rebuilding Analyses

In the case of depleted species, stock assessment results form the basis of a rebuilding analysis, which in turn is used to develop rebuilding policies and choose the rebuilding target identified in each rebuilding plan. The elements of rebuilding analyses are described in the SSC Terms of Reference for Rebuilding Analyses{SSC, 2005 1334 /id}. This guidance has been incorporated into a computer program for conducting rebuilding analyses developed by Dr. Andre Punt and the Marine Population Assessment & Management Group (MPAM) at the School of Aquatic & Fishery Sciences, University of Washington. Copies of the computer software and documentation can be found at the MPAM web page at: fish.washington.edu/research/MPAM/Rebuild.htm.

In a rebuilding analysis the probability the depleted stock will reach the target biomass defining a rebuilt stock (B_{MSY} or $B_{40\%}$) is determined in the absence of fishing (T_{MIN}) and the maximum permissible rebuilding time under National Standard Guidelines (T_{MAX}). The target rebuilding year (T_{TARGET}) is determined based on these limits and the probability of achieving the target biomass by T_{MAX} (denoted P_{MAX}). Probability statements are an estimate that something may happen (in this case, that stocks will reach a given size in a specified time period) and thus also the level of risk associated with a given action. Additional information on rebuilding analysis and interpretation of results can be found in Section 3.2.2.2 of Amendment 16-1 to the Pacific Coast Groundfish FMP{PFMC, 2003 1066 /id}.

The MSA mandates these rebuilding periods need to be the shortest time possible while taking into account the status and biology of the depleted stock, the needs of fishing communities, and the interaction of the depleted stock within the marine ecosystem. This mandate was underscored in an August 2005 ruling by the Ninth Circuit Court of Appeals in a challenge to the Council's darkblotched rockfish rebuilding plan. In accordance with that ruling, the Council decided to reconsider all adopted rebuilding plans to ensure they comply with the MSA as interpreted by the courts. In addition to the court ruling, federal legislation has been introduced to reauthorize the MSA and NMFS is currently considering revisions to the National Standard Guidelines regarding the prevention of overfishing while achieving sustainable yield. Therefore, in the near future, the SSC is likely to review and revise the Terms of Reference for Rebuilding Analyses accordingly.

6.1.6 License Limitation, Capacity Reduction, and Fleet Rationalization

Declining fishing opportunity and increased importance in stock rebuilding and sustainable fisheries since the late 1990s have created the need for smaller, more efficient fishing fleets and more responsive management tools and monitoring programs. NMFS recently completed a capacity reduction program for the limited entry trawl sector and the Council is in the process of rationalizing the remaining trawl fleet through the developing intersector allocations and a limited access privilege program. A full discussion of these long-term management strategies is presented in Appendix A, Section 1.2.4. of the 2005-2006 groundfish harvest specifications FEIS {PFMC, 2004 1127 /id}.

6.2 Enforcement

Enforcement of fishery regulations has become increasingly complex with the addition of large closed areas, smaller cumulative trip limits and bag limits, and depth-based closures for commercial and recreational fisheries. At the same time, decreased OYs and the need to rebuild depleted stocks has placed additional importance on controlling and monitoring fishery related mortality. Enforcement agencies continue to use traditional methods to ensure compliance with groundfish fishery regulations including dockside sampling, at-sea patrols, and air surveillance. VMS dramatically enhances, rather than replaces, traditional enforcement techniques. Recent declines in enforcement agency budgets, combined with increased regulatory complexity, have stressed the ability to adequately monitor fisheries for regulatory compliance. In response, NMFS implemented a VMS, which includes satellite tracking of vessel positions and a declaration system for those vessels legally fishing within an RCA. VMS was initially implemented on January 1, 2004 and is currently required on all vessels participating in the groundfish fishery with a limited entry permit. In November 2005, the Council recommended expansion of VMS requirements to all commercial vessels that take and retain, possess or land federally-managed groundfish species taken in federal waters or in state waters prior to transiting federal waters. Additionally, to enhance enforcement of closed areas for the protection of groundfish essential fish habitat, the Council recommends requiring VMS on all non-groundfish trawl vessels including those targeting pink shrimp, California halibut, sea cucumber, and ridgeback prawn. Implementation of expanded VMS requirements is recommended to coincide with implementation of regulations for the protection of groundfish habitat but, no sooner than January 1, 2007.

6.4 Education and Outreach

California, Oregon, and Washington have actively engaged in education and outreach programs to help recreational fisherman learn ways to minimize bycatch and fishery impacts on depleted species. Efforts include publication of fish identification guides and posters and identification of areas to be avoided due to relatively high abundance of depleted species. Additionally, research programs have been implemented to develop release techniques which reduce mortality and, once developed, educate fisherman in the application of these techniques. Education can be an effective way to reduce bycatch thereby reducing the need for intensive inseason management and frequent fishery closures due to the constraints of depleted species.

6.5 Managing with Risk and Uncertainty

Uncertainty in fishery management exists for many reasons including imperfect sources of data from the past, inaccurate or inadequate monitoring of current fisheries, and unknown future environmental conditions. All of these factors contribute to the risks associated with the assessment of stock status, the estimation of impacts to fish stocks due to fishery management measures, and the projections of future stock health under varying long-term management alternatives. Appendix A of the 2005-2006 groundfish harvest specification FEIS includes discussions of risk in fishery management {PFMC, 2004 1127 /id}; a detailed discussion of short-term costs versus long-term risk may be found in Section 1.2.1. For more information on the assessment of risk in long-term stock population projections see Section 1.1.1.2.

7.0 SOCIOECONOMIC

7.1 Affected Environment

7.1.1 Introduction

The Pacific Coast groundfish fishery is a multi-species fishery (over 90 groundfish species) taking place off the coasts of Washington, Oregon, and California where groundfish are harvested as target catch or indirectly as bycatch in other fisheries. Groundfish fishermen themselves participate in other fisheries as well. These other fisheries include salmon, highly migratory species, coastal pelagic species, shrimp, and crab, amongst others. All of these fisheries contribute to a wide range of commercial, recreational, and tribal activities that have economic, social, and cultural significance to those engaged in harvesting fish resources. Fish buyers and processors, suppliers of commercial and recreational fishing equipment and services, and fishing communities depend on these fisheries. The aim of this chapter is to describe these activities and relate them to the conservation and management measures being proposed, particularly in the context of the effects of reducing the bycatch of the seven overfished species. Information will also be provided that relates to another FMP objective of maintaining year-round groundfish fishing.

The information and organization of this discussion of the socio-economic environment draws upon the following documents—in many instances repeating or summarizing the relevant information, and, in other instances, updating the information provided:

> The Groundfish EFH document {NMFS (National Marine Fisheries Service) 2005. Pacific Coast Groundfish Fishery Management Plan, Essential Fish Habitat Designation and Minimization of Adverse Impacts, Final Environmental Impact Statement. National Marine Fisheries Service, Seattle, WA, December 2005},
>
> The Bycatch EIS {NMFS (National Marine Fisheries Service), the Pacific Coast Groundfish Fishery Management Plan, Bycatch Mitigation Final Environmental Impact Statement, NMFS, Seattle, WA, September 2004}
>
> The final EIS for the 2005-06 specification document {PFMC (Pacific Fishery Management Council) 2004. Final Environmental Impact Statement for the Proposed Groundfish Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-06 Pacific Coast Groundfish Fishery. Pacific Fishery Management Council. Portland, OR, October 2004.}
>
> The analyses and concepts developed for assessing the needs of fishing communities that were presented at the April 2006 Council meeting {Agenda F.1 Groundfish Item F.1 Supplemental Attachments 6-8)}

7.1.1.1 Management Context

The industry and community descriptions and impact analyses found in this chapter are shaped by the typical analyses undertaken to address the setting of harvest quotas and associated management measures, but also by the recent ruling of the Ninth Circuit Court of Appeals concerning rebuilding plans for overfished species. Therefore, it will be useful to summarize the basic context of the current FMP and the important directions for management provided by the Ninth Circuit.

Current FMP

The Council allocates harvest specifications (OYs) between the limited entry and open access categories. Most of the Pacific coast commercial groundfish harvest is taken by the limited entry fleet. Commercial harvest rates of groundfish are constrained by annual harvest guidelines, two-month or one-month cumulative period landing limits, individual trip limits, size limits, species-to-species ratio restrictions, area closures, and other measures. This program is designed to control effort so that the allowable catch is taken at a slow enough rate to stretch the season over the full year. Cumulative period catch limits are set by comparing current and previous landings rates with the year's total available catch and predicted participation

The groundfish limited entry program applies to bottom and midwater trawl, longline, and trap (or pot) gears. Each limited entry permit is endorsed for a particular gear type and that gear endorsement cannot be changed, so the distribution of permits among gear types has been fairly stable. Each permit also has a vessel length endorsement. The total number of permits has typically changed only when multiple permits have been combined to create a new permit with a longer length endorsement. However, in December 2003, a buyback program permanently retired 91 trawl permits, roughly 35% of the total. Limited entry permits can be sold and leased out by their owners, so the distribution of permits among the three states often shifts. At the beginning of 2003, roughly 39% of the limited entry permits were assigned to vessels making landings in California, 37% to vessels making landings in Oregon, and 23% to vessels making landings in Washington.

Other non-tribal commercial fisheries, which either target groundfish or catch them incidentally, but do not hold groundfish limited entry permits, are considered "open access." Gears used by participants in open access commercial fisheries include longline, vertical hook-and-line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl gears. Open access trawl gear may not target groundfish, but may land incidental groundfish caught while targeting other species. Open access trap/pot and longline vessels may target groundfish under certain restrictions. Open access vessels may possess limited entry licenses for other, state-managed nongroundfish fisheries such as pink shrimp or Dungeness crab.

Members of the Makah, Quileute, Hoh, and Quinault tribes participate in tribal commercial, ceremonial and subsistence fisheries for groundfish off the Washington coast according to their treaty rights. Participants in the tribal commercial fishery use similar gear to non-tribal commercial fishers who operate off Washington, and groundfish caught in the tribal commercial fishery is typically sold through the same markets as non-tribal commercial groundfish catch. There are set tribal allocations for sablefish and Pacific whiting, while the other groundfish species' allocations are determined through the Council process in coordination with the tribes, states, and NMFS. Management of tribal fisheries is done by the individual tribes in accordance with their tribal practices.

In addition to commercial and tribal fisheries, there are recreational fisheries associated with the groundfish fishery. Marine recreational fisheries consist of charter vessels, private vessels, and shore anglers. Charter vessels are larger vessels for hire, which typically can fish farther offshore than most vessels in the private recreational fleet. Shore-based anglers often fish in intertidal areas, within the surf, or off jetties. Recreational fisheries are managed by a series of seasons, area closures, and bag limits.

Ninth Circuit

Since 2000, the management of West Coast groundfish fisheries has been heavily centered on the need to rebuild overfished groundfish species. A species is considered overfished when its biomass is below 25% of its estimated unfished biomass level. West Coast groundfish stocks are highly inter-mixed, meaning that overfished species co-occur and are caught in common with more abundant groundfish stocks. This inter-mixed nature of groundfish stocks means that eliminating the directed targeting of overfished species usually does not achieve the catch reductions needed to meet rebuilding goals. To adequately constrain total catch of overfished species, management must also constrain targeted fishing on healthy stocks that co-occur with overfished species in order to reduce incidental overfished species catch. This need to constrain harvest of healthy stocks has economic implications to sectors and communities engaged in fish harvesting and processing, because of the loss in landings and revenue that could have been derived from both overfished species and many target species that co-occur with those overfished species. The reader is referred to Chapter 2 Table 2-1 for a full presentation of the levels of overfished species and target species being considered in this EIS along with the relevant associated conservation and management measures that exist to constrain harvests so that these levels are not exceeded as well to equitably distribute the burden of conservation and management across the various harvest groups. These user groups are listed in tables such as Table 2-4, which are otherwise frequently referred to as Bycatch Scorecards."

According to the Magnuson-Stevens Fishery Conservation and Management Act, when a fishery is overfished, any fishery management plan, amendment, or proposed regulations shall:

A) *specify a time period for ending overfishing and rebuilding the fishery that shall—*
- *i)* *be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock of fish within the marine ecosystem; and*
- *ii)* *not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise;*

B) *allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery*

As indicated in Chapter 2 (Section 2.1.1), in response to the August 2005 ruling by the Ninth Circuit Court of Appeals, the Council though this EIS is reconsidering its rebuilding plans for all overfished species to ensure they comply with the MSA as interpreted by the Court. The Court's interpretation of the rebuilding requirements of the MSA can be summarized to include the following directions: 1) the rebuilding periods must be as short as possible; 2) that short-term needs of fishing communities may be taken into account in setting rebuilding periods; and 3) to avoid disastrous short-term consequences, limited quotas may be set that allow for some fishing of plentiful species, despite the inevitability of bycatch.

For purposes of assessing the needs of fishing communities, the Council adopted the following general definition at its April 2006 meeting: DBD—need to check language against the actual motion:

> Fishing Communities need a sustainable fishery that is safe, well managed, and profitable, that provides jobs and incomes, that contributes to the local social fabric, culture, and image of the community, and helps market the community and its services and products.

Therefore, in comparison, to previous EISs undertaken for the Pacific Groundfish Fishery Management Plan, this chapter where appropriate, in addition to the typical approaches undertaken, will provide more detailed and focused socio-economic information and analyses relating to rebuilding species and fishing communities.

Overview of General Trends

In addition to the management context, it is important to understand the fisheries context that underlies the determination of the conservation and management measures being developed through this EIS. For purposes of discussion, the Groundfish Fishery will be described in terms of overall landings as a means of describing recent trends and for describing alternative ways that various groundfish sectors are classified. As groundfish fishermen fish in fisheries other than groundfish and groundfish communities depend on other fisheries as well, it is also important to the groundfish fishery in relation to other West Coast fisheries.

Groundfish Fishery

Harvest Sectors and Sub-sectors, Landings and Revenues

As discussed above, the Groundfish fishery is made up by many components. Table 7-1 shows sector trends in harvests from 1995 to 2004. These components are often summed in various ways depending on the management issue. For example, the non-tribal whiting fishery is comprised of three sectors—At-sea catcher processors, at-sea motherships, and shoreside whiting limited entry trawl. The total whiting fishery is made up of the non-tribal whiting sector and the tribal shorebased and at-sea whiting fisheries. Shorebased landings can be estimated by summing Shoreside Whiting Limited Entry Trawl, Shorebased Non-Whiting Limited Entry Trawls, Shoreside Limited Entry Line Gear, Shoreside Limited Entry Pot Gear, Shoreside Directed Open Access, and Shoreside Incidental Open Access landings. Throughout the remainder of this chapter, the discussion will involve one or more of these components.

Some trends should be noted. For this period, whiting harvests by the at-Sea catcher processors and shoreside whiting limited entry trawl fisheries reached a peak in 2004. Tribal shoreside landing also reached a peak in 2004 of 8,698 tons reflecting the recent introduction of a new shorebased tribal whiting fishery. Tribal whiting fisheries were first instituted in 1996 with advent of the at-sea tribal fishery. Harvests by shoreside non-whiting fishery limited entry trawl fleet and recreational fleets reached their lowest levels in 2004 a harvests. When combined, all non-whiting and non-tribal sectors reached a period low of commercial shoreside sectors by the shoreside non-whiting limited entry trawl fleet were at their lowest as was the recreational catch. As Pacific whiting is a highly variable species, often times analysts focus on the non-tribal commercial shoreside landings other than whiting. When this is done, landings shoreside by non-whiting non-tribal commercial sectors also reached a low in 2004, approximately 25,000 tons compared with the 59,000 and 60,000 tons of landings in 1995 and 1996, respectively. The decline in such landings mirrors status of the stocks and Council efforts to rebuild overfished species.

Table 7-1 also shows the percentage shares of each sector of the total fishery. In terms of total non-whiting-non-tribal harvests, there has been a small decline in non-whiting limited entry trawl share from past levels of greater than 75% to the current level of 71%. This has been matched by a slight increase in the recreational share, from 4% to 5% in 1995 and 1996 respectively to current levels of 7 and 8 percent. (The sharp temporary increases in recreational harvests in 1998 and 2003 are due to increases in Central and Northern California recreational harvests of lingcod, widow rockfish, and rockfish contained in the category “minor rockfish south.)

Tables 7-2a, 7-2b, and 7-2c list 1981 through 2005 commercial landings by round weight, exvessel revenue in current dollars, and exvessel revenue in inflation-adjusted dollars for commercially important species on the West Coast. These tables echo the trends discussed above but from a more historical perspective. Table 7-2a shows the large volume of Pacific whiting landings and the emergence of shore-based processing in the early 1990s. (Note that the at-sea sector includes joint venture fisheries occurring in the 1980s. “Americanization” ultimately replaced foreign processors with domestic ones.) While total groundfish landings peaked in 1994, landings of species other than whiting continued a long-term declining trend during this period. Total groundfish landings measured by weight peaked in 1994 at 305,312 mt and have declined by nearly half since. Flatfish, sablefish, and rockfish landings all peaked in 1982, the first full year under Groundfish FMP management. (Note that some decline in landings is to be expected as standing stocks are “fished down” to MSY biomass.) Landings in all groundfish species categories declined steeply after 1998, when species began to be designated overfished. Rockfish landings fell by about three-quarters from 1998 to 2002.

Table7-2b shows total groundfish exvessel value peaking in 1997 at $101.2 million, three years after the peak in total groundfish landings. The difference between these trends is partly explained by the observed run up in exvessel prices for sablefish between 1994 and 1997 at a time when total sablefish landings were pretty stable. Total exvessel value of groundfish landings declined 43% to about $58 million in 2003.

Table 7-2c adjusts the values in Table 7-2b for inflation, allowing a more direct comparison of the real value of landings between years. Low-value whiting is a much less prominent component of landings when measured this way. Measured in constant 2005 dollars, the change in the value of rockfish landings between 1998 and 2003 fell by more than two thirds. The inflation-adjusted value of sablefish and flatfish landings remained fairly stable during this period. Measured in constant 2003 dollars, total groundfish landings value was greatest in the late 1980s, peaking in 1989 at almost $132 million. By 2003, the inflation adjusted value of total groundfish landings had fallen by more than half.

Whiting harvests reached an all time high in 2005 at about 260,000 tons whereas for the other groundfish species there are significant declines starting in 1998 with 2005 showing very slight increases in harvests compared to 2004. In terms of ex-vessel revenues, since the whiting fishery was at an all time high, total groundfish revenues showed an increase significant increase in 2005 to $73 million which is still below the 1981-1997 average of $115 million. (Note that whiting and the other categories include tribal harvests.) In terms of non-whiting groundfish revenues, 2005 showed a slight increase over 2004 to $43 million due to increased sablefish revenues but is still below the 1981-1997 inflation adjusted average of $91 million. (1981-1997 is used as a basis of comparison because the downward trends in lingcod and rockfish started their sharp declines in 1998 and thus the beginning of rebuilding efforts.)

Groundfish Fishery In Relation to Other West Coast Fisheries

Tables 7-2.a through 7-2.c also show the other west coast fisheries harvests and revenues.

Total west coast harvests reached 440,000 tons in 2005 worth $281 million. Of these amounts, groundfish fisheries accounted for 50% of the harvests and 25% of the revenues. In terms of total exvessel revenues, Dungeness Crab was the only fishery that had higher revenues in 2005. Note that squid was the only major fishery that had a significant increase as the Dungeness Crab, salmon, and HMS fisheries all had significant declines in 2005 compared to 2004 adding up to a total West Coast decline in non-groundfish revenues of about 12%. Declines in non-groundfish fisheries make groundfish communities, who are already facing declining groundfish revenues, more vulnerable while often leading to increase effort in groundfish fisheries. As described below, many of these non-groundfish fisheries are part of the groundfish “open access” fleets. (As most of these fisheries are “shoreside fisheries” see 7.1.2.1 for additional discussion.)

Bycatch and Fisheries

Table 7-3 shows for these sectors or their subcomponents, the various bycatch associations; To identify likely distributional affects of reductions in overfished species mortality, NMFS Northwest Region working with members of the GMT constructed a relational database. This database used available data on the interaction of fishery sectors with overfished species, and historical management actions that have been taken to achieve management targets of overfished species. Information from the 2005 groundfish stock assessments was used to identify the distributional range of various overfished species, and then analyzed in conjunction with the size of fishing sectors on a regional basis. The resulting combined effect of relative stock size and relative fleet size helps identify the risk that a regional component of a fishing sector poses to a stock of an overfished species. In this case, “risk” is the potential catch that a particular regional sector has the potential to attain relative to the OY and relative to the capability of other sectors operating in the same area. Using this information on the relationship of groundfish stock and fleet sizes, a data set was constructed that identifies sectors that have high, med-high, med-low, and low or no impact on each overfished species, within a coastwide series of latitude-bounded management areas. Fishing sectors that were analyzed include:

1. limited entry bottom trawl – deep
2. limited entry bottom trawl –shelf
3. limited entry midwater trawl – Pacific whiting
4. limited entry fixed gear – sablefish
5. limited entry fixed gear – nearshore
6. limited entry fixed gear – dogfish
7. open access fixed gear – sablefish
8. open access fixed gear – nearshore
9. open access fixed gear – dogfish
10. California recreational-bottomfish
11. Oregon recreational-bottomfish
12. Washington recreational-bottomfish
13. Washington recreational-halibut
14. Oregon recreational-halibut

Although other commercial sectors arguably exist, one can reasonably assume that these other sectors are minor compared to those listed, or can be considered a component of one of those sectors listed. Our data set further divided sectors by coastal management area where different overfished species commonly occur: north of 40˚ 10’ N. lat., between 40˚ 10’ N. lat. and 38˚ N. lat., between 38˚ N. lat. and 36˚ N. lat., and south of 36˚ N. lat.. The area north of 40˚ 10’ N. lat. is a traditional area used for management of commercial fisheries and tends to have the highest degree of impact for several overfished species, including darkblotched rockfish, yelloweye rockfish, and Pacific ocean perch. In the area between 38˚ N. lat. and 40˚ 10’ N. lat., darkblotched rockfish populations are more moderate, Pacific ocean perch is nearly non-existent, and the area, and the northern portion the assessed portion of bocaccio rockfish begins. The area south of 38˚ N. lat. and north of 36˚ N. lat. contains few, if any, of the more northern overfished species such as darkblotched rockfish, but canary rockfish still tend to be caught in the area, as well as more southern oriented stocks such as bocaccio rockfish. Few canary rockfish occur south of 36˚ N. lat., but this area contains both bocaccio rockfish and cowcod.

Bycatch and Communities

Inspection of Tables 7-4a and Tables 7-4b shows that every community is touched in some way by the management of overfished species. (Although this table applies to the commercial sectors, recreational fisheries in the communities listed would encounter similar bycatch species.)

How the Rest of This Chapter Is Organized

The rest of this chapter provides detailed descriptions of the various sectors that make of the non-tribal commercial sectors including discussions of participation, landings, revenues, seasonality, and major fishing communities. Tribal and recreational fisheries are discussed in similar fashion. Seasonality information is presented to address considerations associated with promoting a year round fishery. In addition, the processing sector, non-consumptive users, and fishing communities are also described. After these descriptions, the next major section 7.2 describes the economic impacts of the alternatives. These impacts include direct and indirect impacts and cumulative effects.

7.1.2 Commercial and Tribal Fisheries

7.1.2.1 Overview: Total Non-Tribal Shoreside All Fisheries

Participation

Active participation in West Coast shore-based commercial fisheries has generally declined over the years 2000 to 2005 (Table 7-5). In 2005, 1,292 vessels landed West Coast groundfish, 261 landed coastal pelagic species, 1,084 landed crab, 721 landed highly migratory species, 1,339 landed salmon, and 170 landed shrimp. Groundfish vessels accounted for roughly one-third of the west coast fleet. As evidenced by the state permits purchased in the Groundfish Buyback Program, groundfish fishermen participate in these other fisheries as well, especially, the crab and shrimp fisheries. (The estimates, as they are based on fish tickets, exclude estimates of the tribal fleet and at-sea fleet which are discussed below.)

Landings and Revenues

Commercial fisheries make up the largest portion of West Coast landed catch by weight. Coastal pelagic species, followed by groundfish, crab, and highly migratory species have made up the largest landings by weight since 2000. Crab, followed by groundfish, coastal pelagic species, and highly migratory species comprise the highest-value groups from 2000–2005 (Table 7-6). The four largest gear groups by weight have been gill and trammel net, trawl, trap/pot, and troll gear (Table 7-7).

Limited entry trawlers take the vast majority of the groundfish harvest measured by weight but somewhat less if measured by value. In 2003, groundfish trawlers landed over 95% of total groundfish harvest by weight but only 64% by value (Table 7-8). The difference in trawl weight and revenue proportions is mostly due to the catch of Pacific whiting. Since whiting are caught almost exclusively by limited entry trawl vessels, they skew the overall value per unit weight calculations for this sector.

Distribution of Effort and Major Ports

See discussion below of the various subsectors (limited entry trawl, limited entry fixed gear, and open access). As discussed below, trawl vessels make most of their landings in Oregon. Newport, Astoria, and Charleston (Coos Bay), Oregon are three of the largest four ports for landed weight and exvessel revenue. Westport and Ilwaco, WA, Eureka and Crescent City, CA, Brookings, OR, and Bellingham Bay and Neah Bay, WA comprise the remaining top 10 largest ports for trawl vessel landings.

7.1.2.2 Limited Entry Groundfish Trawl Sector

Participation

West Coast limited entry trawl vessels use midwater trawl gear, and small and large footrope bottom trawl gear (defined at 50 CFR 660.302 and 660.322(b)). Midwater trawl gear is not designed to touch the ocean bottom and is therefore used to target groundfish species–such as Pacific whiting and yellowtail rockfish–that ascend above the ocean floor. Small and large footrope trawl gear are designed to remain in contact with the ocean floor and are used to target species that reside along the ocean bottom such as flatfish on the continental shelf and slope, or DTS species (Dover sole, thornyhead and sablefish complex) in deep water. Fishers generally use small footrope trawl gear in areas that have a regular substrate–few rocks or outcroppings–and more widely on the continental shelf than on the continental slope (due in large part to regulatory requirements). Fishers use large footrope trawl gear most commonly in areas that may have an irregular substrate, and along the continental slope and in deeper water.

The limited-entry shore-based trawl vessels primarily deliver their catch to processors and buyers located along the coasts of Washington, Oregon, and California, and tend to have their homeports located in towns within the same general area where they make deliveries. Larger vessels in the shore-based limited entry trawl sector focus more heavily on the DTS complex in deep water, while smaller trawl vessels focus more heavily on the shelf. Large trawl vessels also tend to participate in the trawl fishery for more months of the year than small trawl vessels. The shore-based vessels range in size from less than 40 feet to over 90 feet in length (Table 7-9).

In 2003, a fishing capacity reduction program (buyback) was implemented off the Pacific coast which retired 91 vessels from the limited entry trawl sector. These 91 vessels represented less than 40 percent of the number of boats actively engaged in the limited entry trawl sector, but approximately 50 percent of historic catch. The purpose of the program was to reduce the number of vessels and permits endorsed for the operation of groundfish trawl gear in order to increase and stabilize economic revenues for vessels remaining in the groundfish fishery and conserve and manage depleted groundfish species. Vessels that participated in the buyback program were sold, scrapped, or converted to nonfishing purposes, and those vessels cannot be used for fishing again.

The impact of the trawl vessel buyback appears to have been positive in terms of exvessel revenue per vessel. Average trawl exvessel revenues generated by non-Pacific Hake groundfish increased from approximately $108,000 to $151,000 in the years 2003 to 2004 respectively even though total exvessel revenues for the fleet decreased from approximately $25,000,000 to $22,000,000 during the same period (Figure 7-1). Declining total bottom trawl revenues in 2005 resulted in a slight decline in average revenue per vessel compared to 2004.

The impact of the trawl vessel buyback differed by region. Some ports lost a disproportionate share of their trawl fleet, while others lost relatively few trawl vessels (Table 7-10). The number of trawl landings in the major trawl ports of Eureka, Crescent City, and Avila declined by 50 percent or more.

7.1.2.2.1 Landings and Revenues from Groundfish Trawl Vessels

Trawlers catch a wide range of species. By weight, the following species account for the bulk of landings (other than Pacific whiting): Dover sole, arrowtooth flounder, petrale sole, sablefish, thornyheads, and yellowtail rockfish. Management measures intended to reduce the directed and incidental catch of overfished rockfish and other depleted species have significantly reduced rockfish catches in recent years substantially below historical levels. Of the three states, landings and revenues by non-tribal trawlers are significantly larger than the other two states (Table 7-11)

By weight, the vast majority of trawl vessel groundfish is caught with midwater trawl gear. This is due to the fact that Pacific whiting is targeted with midwater trawl gear. In contrast, the majority of trawl exvessel revenues are attributed to the bottom trawl sector). (Table 7-12)

Limited entry trawlers take the vast majority of the groundfish harvest measured by weight but somewhat less if measured by value. In 2003, groundfish trawlers landed over 95% of total groundfish harvest by weight but only 64% by value (Table 7-13). The difference in trawl weight and revenue proportions is mostly due to the catch of Pacific whiting. Since whiting are caught almost exclusively by limited entry trawl vessels, they skew the overall value per unit weight calculations for this sector.

7.1.2.2.2 Distribution of Effort by Limited Entry Groundfish Trawl Vessels

Limited entry trawl vessels focus much of their effort on DTS species along the slope, flatfish species along the shelf, and Pacific whiting above the seafloor. Historically, much effort was focused on rockfish species, but recent regulatory requirements–such as RCAs and various cumulative limits - have curtailed rockfish opportunities to protect overfished stocks. In 2005, a specific small footrope trawl designed to avoid rockfish (the selective flatfish trawl) will work to further avoid the catch of rockfish along the shelf while increasing opportunities for flatfish north of 40º 10' latitude. Opportunities to harvest DTS and flatfish species–largely in the form of differential cumulative limits and RCAs–dictate the location of much of the trawl effort, though not all effort is dictated by regulation. Vessels differ in size and technical capacity. For example, small vessels may find it more difficult to fish during the winter months because of weather and other vessels may not have the capacity to fish in deep water where DTS species primarily reside. In other cases, some vessel captains may be more knowledgeable and more successful in certain areas. This knowledge would also influence the location and timing of effort by certain vessels. Furthermore, some species are known to migrate and aggregate during certain months of the year. For example, Petrale and Dover sole are known to aggregate for spawning during the winter months, and several types of flatfish are known to migrate onto the shelf during the summer months. Fishers may target the location of their efforts according to species aggregations and *the tendencies of certain fish species to migrate. Differences in knowledge, capital constraint, fish migration, and the regulatory environment can–in large part–affect the location and time of effort by commercial fishing vessels.*

Table7-14 shows the depth-based annual distribution of catch made by non-shrimp trawl vessels and Table 7-15 shows the monthly distribution of catch as recorded in trawl logbook data within PacFIN. These data include bottom trawl and midwater trawl gear.

By weight, because of the buyback program, some ports appear to have lost relatively more groundfish catch than other ports. Not surprisingly, those ports that lost relatively more trawl vessels also appear to have lost relatively more catch of groundfish (Table 7-16).

Trawl vessels make most of their landings in Oregon. Newport, Astoria, and Charleston (Coos Bay), Oregon make up three of the largest four ports for landed weight and exvessel revenue during the 2000–2003 period (Table 7-17). Westport and Ilwaco, WA, Eureka and Crescent City, CA, Brookings, OR, and Bellingham Bay and Neah Bay, WA comprise the remaining top 10 largest ports for trawl vessel landings.

7.1.2.3 At-Sea Limited Entry Sector

Participation

In addition to the shore-based limited entry trawl fishery, an at-sea limited entry trawl fishery exists off the coast of Washington, Oregon, and California. The high-volume at-sea fishery targets Pacific whiting with the use of midwater trawls. Pacific whiting commands a relatively low price per pound in the market place. The limited entry at-sea sector is made up of a catcher-processor fleet and a mothership/catcher vessel fleet. A catcher-processor participates in both catching and processing; a mothership engages only in the processing of a particular catch, and relies on catch made by catcher vessels. Many of the catcher vessels that deliver to the West Coast mothership sector may also fish as West Coast shore-based trawl vessels outside the Pacific whiting season; other catcher vessels fish in West Coast waters only during Pacific whiting fishery and return to North Pacific fisheries when the Pacific whiting season closes.

The catcher/processor sector is comprised of vessels that harvest and process whiting (the fleet has typically been 6 to 7 vessels since the formation of the Pacific Whiting Conservation Cooperative in 1997). The mothership sector is comprised of catcher vessels that harvest whiting for delivery to motherships (typically 3-5 motherships operate in the fishery, with one mothership also servicing the tribal fleet). Motherships are vessels that process, but do not harvest, whiting.

According to PacFIN data, the at-sea sector annually catches over 100 million pounds of Pacific whiting, as well as several hundred thousand pounds of other types of West Coast groundfish

Unfortunately, readily available data do not exist for estimating the value of at-sea
According to PacFIN data, the at-sea sector annually catches over 100 million pounds of Pacific whiting, as well as several hundred thousand pounds of other types of West Coast groundfish Harvests of non-whiting groundfish are largely composed of harvests of yellowtail rockfish, widow rockfish and rockfish that make up the category “minor rockfish north.”

Harvests and Revenue

Depending on the OY, at-sea harvests by non-tribal motherships and catcher processors have ranged since 1998 from 63,000 tons to the 128,000 tons harvested in 2005 (Table 7-18) worth $14 million (Table 7-19). The amount of non-whiting groundfish harvested by this fleet is quite small, often in the range of less than half of percent.

Distribution of Effort

The catcher-processor fleet and mothership fleet over recent years, typically harvests a major portion of their allocations in May and June. After June, most of the fleets moves on to fish off Alaska, and returns in late August or September where to fish the remainder of their allocations. During the summer months, a few catcher processors may remain to fish whiting.

Major Ports

As the majority of whiting harvested by the non-tribal at-sea fleet is processed into finished product and then transshipped at sea to foreign markets, there are no key at-sea ports, other than Seattle and Anacortes where the corporate headquarters for these companies are located.

7.1.2.4 Limited Entry Groundfish Fixed Gear Sector

Participation

Vessels deploying longlines and traps (pots) comprise the limited entry fixed gear sector. These gear types also may be used by vessels in the open access sector, but preferential harvest limits favor license holders. West Coast limited entry fixed gear vessels typically use longline and fish pots (traps) for catching groundfish. Groundfish longline activities involve anchoring a stationary line with multiple baited hooks attached to it (groundline) to the ocean floor. A buoy line attaches the groundline to a surface float, usually a buoy and pole. Fishermen leave the longline in the water for several hours to a day. The vessel returns to the gear, retrieves the buoy, and hauls the line to the surface to retrieve the gear and fish. Fish pots or traps used to harvest groundfish are generally square and have mesh or twine encompassing the exterior Fishermen drop baited traps to the bottom of the ocean connected to a surface pole or buoy with a vertical line. The fish enter the trap through a door, but cannot exit the trap unless they are small enough to escape through the mesh, or back out the door. These pots are retrieved by the vessel several hours after being set. Both longlines and fish pots can be set across diverse ocean bottom types, though longlines can get hooked on rocky areas or reefs, causing some gear loss. Limited entry fixed gear fishers typically use shore-based vessels that range in size from 30 feet to 65 feet in length, with some vessels exceeding 100 feet, and some as small as 23 feet (Table 7-21). Limited entry fixed gear vessels may also participate in open access fisheries or in the limited entry trawl fishery. Like the limited entry trawl fleet, limited entry fixed gear vessels deliver their catch to ports along the Washington, Oregon, and California coast.

This sector has been plagued by overcapacity, although a series of management initiatives have largely addressed the problem. In the early to mid 1990s the fishery was a "derby" managed by very short seasons of two weeks or less. Two Groundfish FMP amendments have helped to alleviate the symptoms of over capacity in the fixed gear sablefish fishery, effectively eliminating the short, derby season. Amendment 9 required a permit endorsement to participate in the primary sablefish fishery, and Amendment 14 introduced permit stacking. Permit stacking allows up to three sablefish-endorsed permits to be used per vessel. Through a tier system, landing limits vary with the number and type of permits held.

7.1.2.4.1 Landings and Revenue from Limited Entry Fixed Gear Vessels

Fixed gear vessels primarily target the high-value sablefish; this species accounts for a large share of landings, especially when measured by exvessel value. According to PacFIN data, the majority of limited entry fixed gear landings occur in Oregon and Washington. Oregon and Washington also have a higher price per pound for sablefish, while California has a higher price per pound for other types of groundfish. This is most likely representative of the higher amount of high valued live fish landings that occur in California, as opposed to Oregon and Washington (Table 7-22).

7.1.2.4.2 Distribution of Effort by Limited Entry Fixed Gear Vessels

Limited entry fixed gear vessels principally target sablefish, a species that tends to reside in relatively deep water (Table 7-23). The limited entry fixed gear sector is subject to rockfish conservation areas; however, the boundaries are somewhat different from those of the limited entry trawl sector. Fixed gear vessels are more prone than trawl vessels to catching some overfished rockfish species, such as yelloweye rockfish, and are therefore restricted from fishing on the continental shelf. Limited entry fixed gear vessels exert most of their effort during the late spring, summer, and early fall. The monthly distribution of effort has become more spread out over the year, and the number of vessels participating has declined as the tier system and permit stacking provisions were put in place in 1998 and 2001 respectively

Major Ports

Table 7-24 shows the top 15 ports (of the 62 receiving landings) for limited entry fixed gear landings and exvessel revenue from 2000–2003. The largest ports for limited entry fixed gear landings and exvessel revenue, located within Washington, Oregon, and northern California, differ only slightly in the order of landings by rate and of exvessel revenue. The top five ports for landings make up approximately 54% of total landings, while the top five ports for revenue make up approximately 49% of total exvessel revenues for limited entry fixed gear vessels.

7.1.2.5 Open Access Groundfish

7.1.2.5.1 The Groundfish Open Access Sector

The open access sector consists of vessels that do not hold a federal groundfish limited entry permit and target (Open Access Directed Fisheries) or incidentally (Open Access Incidental Fisheries) catch groundfish using a variety of gears. The open access appellation can be confusing because vessels in this sector may hold limited entry permits for other, nongroundfish fisheries issued by the federal or state governments. However, groundfish catches by these vessels are regulated under the groundfish

FMP. For example, open access vessels must comply with cumulative trip limits established for the open access sector and are subject to the other operational restrictions imposed in the regulations, including general exclusion from the RCA.

Open Access Directed Fisheries

Participation in the directed open access fishery segment varies between years. Participants may move into other, more profitable fisheries, or they may have taking time off from fishing, or they may quit fishing altogether. Fishers use various non-trawl gears to target particular groundfish species or species groups. Longline and hook-and-line gear are the most common open access gear types used by vessels directly targeting groundfish and is generally used to target sablefish, rockfish, and lingcod. Pot gear is used for targeting sablefish, thornyheads and rockfish. Though largely restricted from use under current regulations, in the past in Southern and Central California setnet gear was used to target rockfish, including chilipepper, widow rockfish, bocaccio, yellowtail rockfish, and olive rockfish, and to a lesser extent vermillion rockfish.

Within the directed open access fishery, fishers are further grouped into the “dead” and/or “live” fish fisheries. The terms dead and live fish fisheries refers to the state of the fish when it’s landed. The dead fish fishery has historically been the most common way to land fish. In 2001, the dead fish fishery made up 80% of the directed open access landings. However, more recently, the market value for live fish has resulted in increased landings in the live fish fishery. In 2001, 20% of fish landed (by weight, coastwide) by directed open access fishers was landed alive as compared to only 6% in 1996 {(PFMC 2004 PFMC 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for 2005-2006 for the Pacific Coast Groundfish Fishery. Pacific Fishery Management Council, Portland, OR, August 2004)}.

In the live-fish fishery, groundfish are primarily caught with hook and line gear (rod-n-reel), with limited entry longline gear and with limited entry pot gear, and a variety of other hook gears (e.g. stick gear). The fish are kept alive in a seawater tank on board the vessel. California halibut and rockfish taken in gill and trammel nets have increasingly appeared in the live fish fishery {(CDFG 2001) CDFG. 2001. California Marine Living Resources: A Status Report, December 2001. Sacramento, California. (Available on-line: www.dfg.ca.gov/mrd/status)}.. Live fish are sold at a premium price to food fish markets and restaurants, primarily in Asian communities in California. Only limited information exists on the distribution of effort by open access vessels. Because the open access sector has an increasingly large live-fish fishery component with nearshore species making up most of the live fish landings, effort located near shore likely accounts for most live fish landings.

In California, hook and line gear for the live-fish fishery has been limited, since 1995, to a maximum of 150 hooks per vessel and 15 hooks per line within one mile of the mainline shore {(CDFG 2001) CDFG. 2001. California Marine Living Resources: A Status Report, December 2001. Sacramento, California. (Available on-line: www.dfg.ca.gov/mrd/status)}.. Traps are limited to 50 per fisherman. In Washington, it is illegal to possess live bottom fish taken under a commercial fishing license. In Oregon, nearshore rockfish and species such as cabezon and greenling are the primary target of the live fish fishery. Sablefish and rockfish are also landed alive in Oregon, and are managed under limits which count against the federally set limited-entry allocations. The Oregon live fish fishery occurs in waters of ten fathoms or less (18 m). Only legal gears are allowed to be used to catch nearshore live fish. In early 2002, an Oregon Development Fisheries Permit was required for fishermen landing live fish species (e.g. Cabezon, greenling (except kelp greenling), brown, gopher, copper, black and yellow, kelp, vermilion, and grass rockfish (among others), buffalo sculpin, Irish lords, and many surfperch species). However, commercial fishing for food fish is prohibited in Oregon bays and estuaries and within 600 feet (183 m) seaward of any jetty.

Participation

Many fishers catch groundfish incidentally when targeting other species, because of the kind of gear they use and the co-occurrence of target and groundfish species in a given area. Managers classify vessels as being in the open access incidental fishery if groundfish comprises 50% or less of their landings, measured by dollar value. These incidental open access fisheries may also account for substantial amounts of bycatch, especially for overfished groundfish species. Fisheries targeting pink shrimp, spot prawn, ridgeback prawn, California and Pacific halibut, Dungeness crab, salmon, sea cucumber, coastal pelagic species, California sheephead (California nearshore fishery), highly migratory species, and the mix of species caught in net fisheries comprise this incidental segment of the open access sector. These fisheries and associated target species are described below.

The open access groundfish fishery consists of many vessels that predominately fish for other non-groundfish species where they inadvertently catch and land groundfish. Because these incidental vessels do not necessarily depend on their revenue from the groundfish fishery as their major source of income, understanding the level of dependency that such participants have on the open access groundfish fishery must be considered in light of their overall fisheries revenues. Table 7-25 shows the number of open access vessels by vessel length and level of dependency on the groundfish fishery (proportion of annual revenue that is from groundfish). Between November 2000 and October 2001, 1,287 vessels landed groundfish in the open access sector of the groundfish fishery. Of these vessels, 771 vessels (60%) had a greater than 5% dependency on the groundfish fishery with 345 of these vessels having a 95-100% level of dependency of groundfish. The open access fishery is dominated by vessels under 40 feet in length. About 78 percent of the vessels that landed open access groundfish between November 2000 and October 2001 were less than 40 feet on length. It is assumed that a portion of these smaller vessels fish exclusively in state waters, and thus would be excluded from the VMS requirements. However, the data is not available to identify the proportion of vessels that fish only in state waters. Approximately 36 percent of the open access vessels had a greater than 65 percent dependency on groundfish, with 56 percent of the most dependent vessels having less than $5,000 in gross fishing income. A greater proportion of vessels with lower levels of dependency on groundfish fell within income categories greater than $5,000. However, increases in higher valued groundfish catch in 2003 (primarily sablefish) may reduce the proportion of open access vessels in the lowest (<$5,000) income category.

As discussed above, fishery managers divide the open access sector into directed and incidental categories. The directed fishery comprises vessels targeting groundfish while the incidental fishery category applies to vessels targeting other groundfish, but landing some groundfish in the process. However, it is difficult to segregate vessels into these two categories because the choice depends on the intention of the fisher. Over the course of a year or during a single trip, a fisher may engage in different strategies and they may switch between directed and incidental fishing categories. Such changes in strategy are likely the result of a variety of factors, including the potential economic return from landing a particular mix of species. Table 7-26 provides recent information on open access participants for the 2000- 2003 period and is taken from the VMS EA.

7.1.2.5.2 Landings and Revenue from Groundfish Open Access Vessels

Rockfish, thornyheads, and sablefish make up most of the open access landings and revenue and hook and line accounts for the largest gear type for open access landings (Table 7-27). Fixed gear catch most open access groundfish, although non-shrimp trawl gear and net gear also make substantial landings (Table 7-28). Open access landings in the state of California have a large live fish component, which is made evident by the relatively high unit value of rockfish in that state compared to the unit value of rockfish in Oregon and Washington.

7.1.2.5.3 Distribution of Effort by Groundfish Open Access Vessels

Limited information exists on the distribution of effort by open access vessels. The open access sector is made up of many different gear types, along with directed and incidental catch, which makes it difficult to discern the location of effort, though based on the diversity of this sector, it is reasonable to assume that effort is widespread across the West Coast. The open access sector has an increasing large live-fish fishery component; because nearshore species make up most of the live fish landings, effort located near shore likely accounts for most live fish landings. The live fish fishery is a quickly growing component of the open access sector and will likely continue to grow in the nearshore areas.

As shown in Table 7-29, open access landings and revenue tend to occur primarily during the spring, summer, and fall months. Assuming that landed catch represents directed open access, and that landed catch is a function of effort, then more open access related fishing activity occurs during the spring, summer, and fall months than winter months.

Fishing Communities

Table 7-30 shows that the top open access ports are Moss Landing, Port Orford, Morrow Bay, Fort Bragg and Gold Beach.

7.1.2. 6 Tribal Fisheries

7.1.2.6.1 The Tribal Fisheries Sector

West Coast treaty tribes in Washington have formal groundfish allocations for sablefish, black rockfish, and Pacific whiting. Members of four coastal treaty tribes participate in commercial, ceremonial, and subsistence fisheries off the Washington coast. Participants in the tribal commercial fisheries use similar gear to non-tribal fishers. Fish caught in the tribal commercial fishery are distributed through the same markets as non-tribal commercial catch.

Participation

Tribal treaty fisheries are place-oriented—limited to the adjudicated U&A areas. This results in immobile fisheries that cannot move to a new location if the resources or habitat are depleted. In addition, the Tribe and its fishermen have a view of ownership of their fishing grounds rooted in centuries of use and control of these grounds. This sense of ownership influences the fishing practices of the tribes and these practices are used by the tribes to develop tribal rules and regulations to stay within the harvest limits established by the council for overfished and abundant stocks. Tribal fisheries take several species for which they have no formal allocations, and some species for which no specific allocation has been determined (7-31). Rather than try to reserve specific allocations of these species, the tribes biennially recommend trip limits for some species to the Council, which tries to accommodate these fisheries.

Groundfish fishing by the tribes occurs primarily with hook and line and trawl (7-32). All tribes participating in groundfish fisheries have longline vessels in their fleets, but as discussed below only the Makah has trawlers; and only the Makah has participated in the Pacific whiting fishery. Makah has the majority of longline vessels, followed by Quinault, Quileute, and Hoh. Since 1996, a portion of the U.S. whiting OY has been allocated to the West Coast treaty tribes. The tribal allocation is subtracted from the whiting OY before allocation to the non-tribal sectors. Since 1999, the tribal allocation has been based on a sliding scale related to the U.S. whiting OY. To date, only the Makah tribe has fished on the tribal whiting allocation. Makah vessels fish with mid-water trawl gear have also been targeting widow rockfish and yellowtail rockfish in recent years.

As the Makah Tribe has the largest tribal fleet, what follows is a detailed description of Makah groundfish fisheries and management practices. Currently, the Makah fleet is composed of 43 boats, an increase of two vessels from 2004 (Table 7-35). Twenty-nine of the boats fish for salmon, sablefish, and halibut. These boats primarily fish from March to October. Ten of the boats are small bottom trawlers. The trawl fishery is open from January to December, but primarily the fishing is done from June to October. The mid-water whiting fleet is composed of 4 mid-water trawlers who deliver to shoreside plants and to two at-sea motherships one of which also participates in the non-tribal mothership whiting fishery. Their season is from May to September. Full retention of rockfish bycatch is required (as is the case in all Makah groundfish fisheries); the bycatch is processed for human consumption and forfeited to the Tribe for distribution to food banks and similar programs. This program avoided wastage and discards of bycatch species, created a disincentive to both the catcher vessels and processor and provides full accounting of bycatch in the fishery. This in turn has reduced bycatch levels of nearly all species.

In the Makah bottom trawl fishery, the Tribe adopted the small foot rope restrictions as a means to reduce rockfish bycatch and avoid areas where higher incidences of rockfish occur. In addition, the bottom trawl fishery is limited by overall foot rope length as a means of conducting a more controlled fishery. Harvest is restricted by time and area to focus on harvestable species while avoiding bycatch of other species. If bycatch of rockfish is above a set limit, the fishery is modified to stay within the bycatch limit. The midwater trawl fishery has similar control measures. A trawl area must first be tested to determine the incidence of overfished rockfish species prior to opening the area to harvest. Vessels are provided guidelines for fishing techniques and operation of their net. Fishing effort is closely monitored by the on-board observer and harvest manager and changes or restrictions are implemented as needed to stay within the bycatch limits. Full retention of rockfish bycatch is required (as is the case in all Makah groundfish fisheries); the bycatch is processed for human consumption and forfeited to the Tribe for distribution to food banks and similar programs. This program avoided wastage and discards of bycatch species, created a disincentive to both the catcher vessels and processor and provides full accounting of bycatch in the fishery. This in turn has reduced bycatch levels of nearly all species. In developing these trawl fisheries, the Makah management practices include testing of gear, area, vessels, and catch composition before the fishery can proceed from one level to the next. In addition, a new or developing fishery must show that it can be conducted in a manner that protects existing fisheries.

Tribal Harvests and Revenues

Tables 7-33 and 7-34 shows recorded landings of groundfish species by treaty tribes from 1995 to 2003as developed by the Northwest Indian Fisheries Commission {Rob Jones, personal communication to John Devore May 18?DVB?-}. Since 1996, Pacific whiting have comprised the vast bulk of tribal landings, even though in 2000 and 2001 whiting landings were relatively low due to reduced coastwide allocations. As shown in Table 7-34, in addition to increases in Pacific whiting harvests, there has been a growth in tribal landings of flatfish and rockfish to bring total tribal groundfish revenues to a level of $7.5 million in 2005.

Distribution of Effort

The bulk of tribal groundfish landings occur during the March through April Pacific halibut and sablefish fisheries. Most continental shelf species taken in the tribal groundfish fisheries are taken during the halibut fisheries, and most slope species are similarly taken during the tribal sablefish fisheries. Approximately one-third of the tribal sablefish allocation is taken during an open competition fishery, in which vessels from the four tribes on the Washington coast have access to this portion of the overall tribal sablefish allocation. The open competition portion of the allocation tends to be taken during the same period as the major tribal commercial halibut fisheries in March and April. The remaining two-thirds of the tribal sablefish allocation is split between the tribes according to a mutually agreed-upon allocation scheme. Specific sablefish allocations are managed by the individual tribes. The fishery begins in March and goes until some time in the autumn, depending on the number of vessels participating in the fishery. Participants in the halibut and sablefish fisheries tend to use hook-and-line gear, as required by the IPHC. For equity reasons, the tribes have agreed to also use snap-line gear in the fully competitive halibut and sablefish fisheries. So a vessel that participated in a fully competitive sablefish fishery, but that did not land any halibut (and therefore was not subject to IPHC requirements), would still be required by tribal regulations to use snap-line gear.

Major Ports

Table 7-35 shows the distribution of vessels engaged in Tribal groundfish fisheries by major port. These ports are Westport, Neah Bay, and La Push.

7.1.3 Recreational Fisheries

In 2004, there was a major change in how recreational statistics are collected for West Coast fisheries, especially for the collection of statistics on California recreational anglers as the methodologies employed under the Marine Recreational Fisheries Statistics Survey (MRFSS) were replaced by those of a California Recreational Fisheries Survey. The California Recreational Fisheries Survey (CRFS) is the new method for estimating total marine recreational finfish catch and effort in California. The CRFS is a coordinated sampling survey designed to gather catch and effort data from anglers in all modes of marine recreational finfish fishing. This program incorporates and updates the comprehensive sampling methodologies of the former Marine Recreational Fisheries Statistics Survey (MRFSS) and the California Department of Fish and Game's (CDFG) Ocean Salmon Project. This program was fully implemented state-wide in January 2004.

The direct comparability of pre-2004 data with data collected under the new system is still being evaluated. So the discussion below replicates the discussion of recreational fisheries and 1996-2003 trends found in: Pacific Fishery Management Council. 2004. Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery Final Environmental Impact Statement as it is still the best available overview of West Coast recreational fisheries. This discussion is then followed by presentation of 2004-2005 recreational data provided by the States through the Council's Groundfish Management Team process. The California estimates reported below are still under review for there are indications that the preliminary data provided significantly underestimate charterboat effort. However, it is believed that when better estimates are corrected, the results will not alter the relative ranking of economic consequences of the alternatives.

Participation

Demand for recreational trips and estimates of the economic impacts resulting from recreational fishing are related to numbers of anglers. In the U.S., over nine million anglers took part in 76 million marine recreational fishing trips in 2000. The West Coast accounted for about 22% of these participants and 12% of trips. 70% of West Coast trips were made off California, 19% off Washington, and 11% from Oregon {Gentner 2001}.

Recreational fishing is an important economic contributor to the west coast in general, and to some communities specifically. The recreational fishing sector can be divided into two groups; the charter fleet and the private fleet. The private fleet is typically made up of vessels owned by residents living in or near areas where they fish. The charter fleet is a for-hire fleet that plays a large role in the tourism sector of many west coast communities, and opportunities to fish on a charter vessel can be a substantial draw for tourists considering a visit to the coast.

The distribution of resident and non-resident ocean anglers among the West Coast states in 2000, 2001, and 2002 demonstrates the importance of recreational fishing, especially in Southern California (Table 7-36). Southern California has more than twice the number of resident recreational marine anglers than the next most numerous region, Washington State. While most of the recreational anglers were residents of those states where they fished, a significant share was also non-residents. Oregon had the largest share of non-resident ocean anglers in all three years.

In terms of vessels, about 750 charterboats make up the charterboat fleet (Table 7-37); estimates of private boats are unavailable. In terms of proportion, Table7-38 shows the distribution of trips by boat mode and region in 2003. Approximately 80% of the trips taken are from private vessels. Almost 90 percent of all trips taken and half of the charter vessel trips are associated with California.

Recreational fishing in the open ocean has generally been declining slightly since 1996 (Table 7-39); however, charter effort has decreased while private effort increased during that period. Part of this increase likely resulted from longer salmon seasons associated with increased abundance. Some effort shift from salmon to groundfish for example likely occurred prior to 1996 when salmon seasons were shortened.

Distribution of Effort

Fishing effort is related to weather, with relatively more effort occurring in the milder months of summer, and relatively less in winter (Table7-38). As might be expected, this effect is more pronounced in higher latitudes, although the reasons include opportunity as well as climate. Salmon seasons are longer in California than in Oregon, which in turn are longer than in Washington. Until recently, groundfish seasons were also more restrictive in Washington, with the lingcod season being closed from November through March.

7.1.3.1 2004-2005 State Recreational Estimates

Through the Pacific Fishery Management Council’s Groundfish Management Team process, total angler trips by mode and by target were developed by each of the States for years 2004 and 2005. In terms of total trips, there was a decline from 1.6 million trips to 1.2 million trips, with all states and modes in decline, particularly the California charter boat mode. (As indicated above, these latter estimates may be underestimates.)

The following estimates of trips where groundfish was a target was provided through the GMT process (Table 7-41). Unlike the total anger trips, total groundfish trips increased by 20 percent in 2005 over 2004. Except for Coos Bay which showed a decline in charter boat trips, this pattern is consistent across all states, areas and ports, and by mode. These estimates suggest that anywhere from 25% (2004) to 40% (2005) of West Coast angler trips are trips targeted on groundfish. It should be noted that groundfish are caught incidentally when other species, such as salmon, are targeted. While the contribution of groundfish catches to the overall incentive to engage in a recreational fishing trip is uncertain, it seems likely that the possibility or frequency of groundfish catch on a trip adds to overall enjoyment and perceived value of the trip.

7.1.4 Buyers, Processors, and Seafood Markets

7.1.4.1 Processors and Buyers

Excluding Pacific whiting delivered to at-sea processors, vessels participating in Pacific groundfish fisheries deliver to shore-based processors within Washington, Oregon, and California. Buyers are located along the entire coast; however, processing capacity has been consolidating in recent years. Several companies have left the West Coast or have chosen to quit the business entirely. Remaining companies have purchased some former plants {Research Group 2003}, but other plants have remained inactive. This has led to trucking groundfish from certain ports to another community for processing. Therefore, landings do not necessarily indicate processing activity in those communities. However, examination of the species composition of landed catch by state can lead to inferences of some processor characteristics.

According to PacFIN data, in 2002 Oregon had the largest amount of groundfish landings (56%), followed by Washington (28%), and California (16%). In contrast, Oregon has the largest amount of exvessel revenue (40%), followed by California (32%) and Washington (22%), respectively. Oregon accounts for the majority of Pacific whiting landings, which creates a large difference between the percentage of landed catch and exvessel revenue because Pacific whiting has a relatively low price per pound. The relatively high amount of Pacific whiting being landed in Oregon may create a case where many processors must generate capacity to handle large quantities at a time. Groundfish processors in Washington may receive landings from Alaska fisheries. Depending on the amount of catch Washington processors can draw from Alaska fisheries, some groundfish processors may require the capacity to process large amounts of product. California processors concentrating on West Coast fisheries may focus on relatively smaller throughput of groundfish.

The seafood distribution chain begins with deliveries by the harvesters (exvessel landings) to the shoreside networks of buyers and processors, and includes the linkage between buyers and processors and seafood markets. In addition to shoreside activities, processing of certain species (e.g., Pacific whiting) also occurs offshore on factory ships.

According to data from the Bureau of Labor Statistics, the number of seafood processing establishments along the west coast has declined in recent years. Further examination of PacFIN data shows the number of companies buying groundfish along the West Coast has also generally declined in recent years. When buyers are classified on a species basis—How many buyers purchased groundfish—we can see slight evidence of a decline in California and Washington (Table 7-42). When buyers are classified on a groundfish gear basis—how many buyers purchased sablefish from fixed gear-sablefish fishermen---evidence of decline is stronger (Table 7-43). Because of the multi-species basis of most buyers it is hard to develop unique counts of buyers by either of these two methods on a state basis. However, the total number of buyers from all fisheries can be uniquely determined. In California, the number of unique buyers in 2005 is estimated to be 465, a decrease of 21 percent from 2004. The number of Oregon buyers fell by 10% and the number of Washington buyers fell by 8% over the same time period.

7.1.4.1.1 Processing Companies Purchasing Groundfish

In terms of quantity, the processing of west coast groundfish is dominated by a small number of companies. For this section, an estimate of unique groundfish companies was derived by grouping PacFIN information on groundfish buyers. Buyers with like names were assumed to be individual companies. For example, a hypothetical buyer with the name ZZZ seafood – Astoria was assumed to belong to the same company as a buyer with the name ZZZ seafood – Ilwaco. Using this approach, the results show that the three largest companies bought approximately 78% of commercially caught groundfish landed on the west coast in the years 2004 and 2005 (Table 7-44, Figure 7-2). When a similar analysis is done based on ex-vessel revenues, the top three companies purchase about 56% of the groundfish sold. (For more accurate estimates, analysts would have to compile lists of affiliated companies and then map them to the PacFIN buyer codes. In addition, estimates of fish purchased by non-affiliated buyers and sold to a company for processing would also have to be developed.)

Supportive of this analysis is a description of the top 10 Seafood suppliers in the United States according to Seafood Business (May 2006); three of which participate in Pacific Groundfish Fisheries. Their corporate strategies affect the Pacific Groundfish fishery. Employment and location of facilities will vary as companies pursue profits, market share, and efficiencies. For example, the build up of Arctic Alaska Company (an Alaska based company who built a surimi plant and fish meal plant in Newport Oregon while bring down catcher processors from Alaska to fish whiting, its eventual sale to Tysons (a major poultry company who wanted to add seafood to its product line), and the selling out of Tyson's fishing business assets (including the shoreside surimi and fish meal plants, and several catcher-processors) to companies like Trident (who before the purchase had little involvement in Pacific groundfish) has indirectly reshaped the Pacific groundfish fishery. Below are the Seafood Business descriptions of Pacific Seafood Group (a shorebased company), Trident Seafoods Corporation (shorebased and at-sea), and American Seafoods Group (at-sea).

> Pacific Seafood Group #1 Sales-$874 million—Key Species: Dungeness crab, halibut, king crab, Pollock, salmon, shrimp. "With 2005 sales of $874 million, Pacific Seafood Group slid into the No. 1 spot on the Seafood Business Top 25 list for the first time this year. After an active 2003 and 2004, Pacific wasn't involved in any acquisitions or mergers last year or early this year. Instead the company grew organically, picking up new customers and increasing sales by approximately $174 million from 2004 to 2005. In 2004, Pacific acquired Seacliff Seafoods, a distributor with facilities in Houston, San Antonio and Wilmington, California. In 2003, the company purchased Starfish, a Bellevue Washington seafood processor and distributor and Craig & Hamiliton, a Stockton, California value-added meat processor. Now Pacific operates 15 processing facilities along the West Coast and 10 distribution facilities in Washington, Oregon, California, Idaho, Montana, Nevada and Utah."
>
> Trident Seafood Corporations #3-Sales-$800 million—Key Species: cod, halibut, whiting, Pollock, king crab, salmon, snow crab. "Trident Seafoods Corp. has been busy growing over the past two months. In March, the company acquired Louis Kemp Seafood, which markets the No. 1 retail surimi-seafood brand, from Con-Agra Foods one of the nation's largest public conglomerates….Then, in April, Trident purchased Ocean Beauty Seafoods' seven Alaska processing facilities and merged its distribution and smoked-fish business with its Seattle rival. The acquisition of Louis Kemp and the deal with Ocean Beauty will surely push Trident's 2006 sales over the $1 billion mark. Trident's prior major acquisition occurred in 2004 when it bought Norquest Seafoods of Seattle and its Portlock and Silver Lining brands. Trident operates 25 fishing vessels and at-sea processors and 18 processing plants throughout Alaska, British Columbia, Washington and Oregon." (Note—In early May 2006 the proposed purchase of Ocean Beauty Seafoods was called off.)
>
> American Seafoods Group #10-Sales $514 million. Key species: catfish, cod, hake, Pollock, scallops, yellowfin sole. "In February, Centre Partners Management sold its remaining 23 percent equity interest in American Seafoods Group to Coastal Villages Region Fund and a management group led by Chairman Berndt Bodal, increasing their ownership to 45 percent and 51 percent respectively of the company's voting equity. The buyers dished out nearly $82 million for the balance of Centre Partners' stake. Centre Partners is the New York investment Group that formed American Seafoods Group with Bodal in 2000, acquiring American Seafoods Co. and Frionor USA's New Bedford, Mass., processing facility from Norway Seafoods. The purchase came two years after the adoption of the American Fisheries Act, which forced many foreign owned fishing fleets out of U.S. waters. American Seafoods expanded in 2002 when it bought Southern Pride Catfish of Greensboro, Ala. Two years later, the company ditched a year and-a-half-long bid for an initial public offering.

7.1.4.1.2 Processing Labor, Processing Capital and the Groundfish Fishery

Processing Labor

Employment and wage information from the Bureau of Labor Statistics shows that seafood processing along the west coast generates approximately \$380 to \$420 million dollars in the form of wages annually to seafood product preparation and packaging employees, and in most years this sector employs over 10,000 workers (Table 7-45). The largest state in terms of processing wages and employees is Washington state, followed by California, and Oregon respectively. Washington benefits from the large degree of participation in Alaska-based fisheries which make up a substantial portion of nationwide catch, while processing in Oregon and California is dominated by catch occurring in west coast fisheries.

In support of this EIS, the Report: “Trends in Fishing and Seafood Processing Related Employment Statistics” which is attached, was developed in an attempt to mine all available federal data on seafood processing and on employment (Attachment 7-1). Its conclusions also support the analysis above. This report also has shed some light on seasonality of employment, age and gender of seafood workers. For the seafood processing industry, the 35-44 age group is the predominant workforce in al three states with this category representing 30-35%.of workers employed. The next largest group is the 45-54 age group. The gender distribution of employees in the seafood processing industry differs across states. California is the most evenly distributed with some counties where female employees outnumber males. In Oregon and Washington males workers are the majority with ~ 60 and 70% respectively.

Processing labor can be generally divided into two types; specialized labor and unspecialized labor. Unspecialized labor is characterized as workers that can easily transition their skills to other industries and employers. For example, a forklift driver could be characterized as an employee within the unspecialized labor category. That worker can easily transition between a seafood processing employer and another employer that may be involved in office supplies for example. Specialized workers are those workers that have a particular skill set which is not easily converted to other industries. Workers in this category include those that fillet fish. Filleting is a skill that is specific to the seafood industry.

Workers within the unspecialized category are typically in higher supply and are relatively easy to hire if there happens to be a shortage of workers in that category. These workers require less training than specialized workers and new laborers in the unspecialized category are unlikely to negatively impact productivity for any given amount of time. Specialized workers on the other hand are relatively short in supply, and if there is a shortage of workers in this category, newly hired specialized labor is likely to require training and will have relatively low productivity in the early stages of their career. In the seafood processing industry, many laborers are transient and their employment is often temporary in nature due to the cyclical nature of fisheries. However, processors are more likely to try to retain specialized laborers on a year round basis as re-hiring and re-training new workers in the specialized category will reduce productivity. This makes the groundfish fishery one of the most important fisheries for many seafood processors.

According to the PFMC Groundfish FMP, the Council attempts to manage the groundfish fishery on a year-round basis. This year round nature of the fishery is important to those processors that try to keep specialized labor employed on a year round basis. A year round fishery keeps product volume flowing through the plants, gives the fish filleters product to process, and ultimately keeps specialized laborers employed. Without a year round fishery, these laborers often find work elsewhere and this negatively affects processing revenue and product quality. Other fisheries are typically not managed on a year round basis because of several reasons including availability (salmon and albacore for example) and seasonal quality of the harvested species (Dungeness crab for example). Groundfish on the other hand can be available to fishers and marketable by processors on a year round basis.

Figure 7-3 depicts the monthly purchases by major buyers of groundfish—each line is a buyer. The lines reflect the percent of total purchases by the buyer that are comprised of groundfish. From this graph, it can be determined that there isn't a single month where there is not at least one major buyer that isn't making a major purchase of groundfish.

Processing Capital

Unlike many forms of processing labor, the capital involved in fish processing is not easily substitutable for use in other industries. Capital tends to be fixed in its location and designed to handle fish products as opposed to some other type of food product. A processing facility is constructed to handle seafood and produce some output product that may be fillets, surimi, head and gutted fish, or some combination of products. The size of these facilities is typically constructed around some expectation of what the future holds-in terms of quantity-for commercial fisheries landings.

Many fisheries are characterized by swings in available product due to seasonality and year to year fluctuations in species abundance. This means that during the off-season, or years when there are declines in species abundance, processor capital is idle. Groundfish (outside of Pacific whiting) was historically one of the more stable fisheries on the west coast, and is a fishery that is prosecuted on a year round basis. This sense of stability combined with an expectation of year round landings historically gave managers of processing plants some increased degree of certainty when planning for the future and investing in capital in an otherwise highly variable and uncertain industry. The recent decline in landings of traditional groundfish species has eliminated much of that certainty and meant that increasing amounts of processing capital have been left idle. Idle capital increases the cost of producing a unit of output, so naturally, some plants reliant on groundfish have closed down and consolidation has occurred within portions of the processing industry {The Research Group. 2003}. This is verified by the decrease in number of processing establishments over the past several years as reported by the Bureau of Labor Statistics (7-45).

7.1.4.2 Markets and Prices

Much of this discussion will be updated after the Council Meeting. Updated or revised sections are marked with a "*". Unless otherwise noted discussion below is taken from the 2005-2006 Groundfish Specifications EIS.

7.1.4.2.1 Live Fish Markets

An important and growing share of groundfish harvest is delivered live. These deliveries help feed the growing trade in live seafood consumed in restaurants. Groundfish delivered live were primarily nearshore rockfish and perch, but also included thornyheads, sablefish and lingcod. About 86% of live fish landings were in California with the remainder in Oregon {PFMC 2004b}. There were no recorded live fish landings in Washington. Significantly higher exvessel price was paid for live product. The coastwide average price for live product was nearly four dollars per pound, compared with under one dollar for other deliveries of the same species.

7.1.4.2.2 West Coast Groundfish and the World Market

West Coast groundfish compete in a global market, not only with similar species produced in other regions of the world, but also with other fish species such as salmon and tuna. In addition, fish compete with other sources of protein in consumers' budgets. More than 4.7 million mt of fish and other seafood were landed in the U.S. in 2000, approximately the same amount landed in each of the prior two years (DOC 2001). West Coast groundfish contributed about 0.14 million mt, 0.13 million mt, and 0.12 million mt to this total in 1998, 1999 and 2000, respectively. Pacific whiting, a relatively abundant but low price species, comprises about two-thirds of West Coast groundfish landings by weight, but only around 10% of groundfish exvessel revenue.

Production of farm-raised fish has increased rapidly in recent years. In 2000, more than 0.4 million mt of cultured fishery products were produced in the U.S., and more than 45 million mt were raised worldwide. Salmon aquaculture demonstrates the emerging importance of farmed species. While commercial salmon harvest is still near the 1980 to 1997 annual average, world salmon supply has tripled since 1980 due to a nine-fold increase in farmed salmon to 1.5 million mt in 2000.

An objective of groundfish management has been to spread harvest of the annual OY over as much of the year as possible. Consequently, groundfish harvesting occurs in every month, although beginning in the late 1990s, it took on increased importance during the summer months when sablefish harvest peaked during the primary limited entry fixed gear fishery. The bulk of whiting fishery also occurs during the summer.

Groundfish have historically provided West Coast commercial fisheries participants with a relatively steady source of income over the year, supplementing the other more seasonal fisheries. Although groundfish contributed only about 17% of total annual exvessel revenue in 2000, seasonally groundfish played a more significant role, providing one-fifth to one-third of monthly exvessel revenue coastwide during April and the three summer months. The peak value contribution by the groundfish fishery in 2000 was sablefish during August (20% of exvessel revenue). Flatfish harvest supplied between 3% and 9% of monthly exvessel revenue throughout the year, and rockfish contributed an additional 2.5% to 6.8% to monthly exvessel revenue. For northern parts of the coast, groundfish is particularly important just before the start of the December crab fishery.

7.1.4.2.3 Exvessel and Fuel Prices*

Table 7-46 lists ex-vessel prices for several west coast species, total groundfish excluding whiting, fuel, and estimates of bottom trawl revenue per hour fished for the period 1999-2005. The period was chosen based on available fuel prices collected by the PSMFC. All prices are averages except the fuel price. Fuel prices are June prices as reported by Newport Oregon fuel docks. The trends in these prices give the following perspectives:

Whiting—prices appear to range very little from year to year
Flatfish—prices declined in 2004 and 2005 but not to the 1999 level,
Rockfish—After a major increase in 2004, price fell significantly in 2005
Total Groundfish—prices in 2004 and 2005 similar but not as low as 1999.
Bottom trawl Revenue per hour—Increased significantly in 2003 and 2004. 2004 increase may be due to the buyback as fleet reduced by 1/3.
Fuel—2004 and 2005 fuel prices significantly higher while total groundfish prices declined

The implications from there trends are that all sectors are facing rising fuel prices; and, some sectors, particularly the bottom trawl sector may also be facing declining ex-vessel prices.

7.1.4.2.4 Exprocessor and Wholesale Prices

While producer prices for groundfish products have not fared quite as badly as for other frozen fish (including salmon), they still are significantly below recent highs. The trend may be flat or still lower in the future {(2005-2006 EIS, Appendix A Table7-9)}. Increasing production of farmed salmon is partly responsible for a continuing slump in salmon commodity prices. Producer prices for meat products in general have been relatively weak, thereby helping to hold down prices for competitive fish protein. Preliminary 2003 estimates of producer price indices for fish and meat products were higher than seen in recent years, possibly due to the continuing improvement in the world economic outlook.

7.1.4.2.5 Trade and Domestic Demand

Most West Coast groundfish compete in the fresh and frozen fish product markets. In 2000 the U.S. imported 1.8 million mt of edible fishery products, including 1.5 million mt of edible fresh and frozen fish products. In 2000 the U.S. exported about one million mt of edible fishery products, including 190,000 mt of edible, fresh or frozen flatfish and groundfish products. One third of edible fishery exports were to Japan. While surimi was the single largest component of total fresh and frozen exports by weight, salmon was the most valuable export, generating $353 million on the 100,000 mt of fresh and frozen product shipped, and another $146 million from exports of canned product. Asia was the largest export region, absorbing 61% of U.S. fishery exports by volume. Japan alone bought 34% of total fishery exports, and South Korea and China took 11% and 10%, respectively {2005-06 EIS, Appendix A Section 7.1}.

From 1910 through the early 1970s, annual per-capita fish consumption in the U.S. generally ran between 10 pounds and 12 pounds edible weight. Beginning in the early 1970s, per-capita consumption increased, and in the mid 1980s began shifting upward again to the 15-pound to 16-pound range where it has generally remained since 1985. In 2000 annual per-capita U.S. fish consumption was estimated to be 15.2 pounds. U.S, Seafood Consumption reached a record 16.6 pounds per capita in 2004.

7.1.4.2.6 Market and Non-market Consumer Goods

For goods exchanged in markets where a consumer price can be determined (for example seafood), price and quantity information can be used to estimate the benefits consumers derive from consumption activities. A given regulatory action may have little or no impact on consumers if changes in the quantity of fish available are insufficient to have an effect on prices. This is especially true if imports or other protein substitutes are readily available. In the market for recreational experiences, individuals pay fees to participate in recreational fishing trips on charterboats. Price and quantity information from these trips might allow estimation of the benefits participants derive from this type recreational fishing. However, charter trips may often be purchased as part of a bundle of goods and services that include nonfishing recreational activities. Therefore, the estimation of benefits from recreational charter activities is less straightforward than for marketed consumer goods.

For other consumer goods, especially bundles of goods and services such as a recreational fishing trip taken on a private vessel, the prices and quantities associated with each transaction are much more difficult to determine. For the private recreationalist, the amount spent on fishing gear, licenses, and other goods necessary to carry out a particular fishing trip is difficult to isolate. The term "private" is used here to designate a recreational fisher fishing from a private vessel, the shore, bank or a public pier, as opposed to using a charter vessel. Depending on the value a particular individual places on alternatives to fishing, the maximum benefit associated with a fishing trip may far exceed actual trip expenditures.

7.1.4.3 Consumptive versus Nonconsumptive Activities

The sectors benefiting from a resource can generally be placed into one of three groups: consumptive users (e.g., recreational fishers, commercial harvesters, and processors), nonconsumptive users (e.g., wildlife viewers), and nonusers (e.g., members of the general public who derive value from knowing that a species is being maintained at a healthy biomass level). The following table displays the general relationship between use/non-use and consumptive/nonconsumptive types of activities.

Relationship between Use/Nonuse and Consumptive/Nonconsumptive Activities

	Consumptive	Nonconsumptive
Use	Commercial and Recreational Fishing, Processing.	Wildlife Viewing
Nonuse	N/A	Existence Value, Options Value, Bequeathal Value

In economic terms, renewable resource management entails a fundamental tradeoff between current and future costs and benefits. When management needs call for a substantial reduction in allowable harvests, additional costs may be born by the direct consumptive users, who may be left with much smaller harvests than they had been accustomed to. While this near-term sacrifice may create much greater harvest opportunities in the future once the stock has been replenished—depending on the duration of the rebuilding period—many fishers and processors may be unable to weather a long down period, opting instead to go out of business.

Nonconsumptive users may benefit from the use and nonuse values provided by the resource. Wildlife viewing and the derivation of secondary benefits from ecosystem services are examples of non-consumptive use values. One or more of the following nonuse benefits may accrue from the preservation of fish stocks at higher levels of abundance: (1) existence value derived from knowing a fish population or ecosystem is protected without intent to harvest the resource; (2) option value placed on knowing a fish population, habitat, or ecosystem has been protected and is available for use, regardless of whether the resources are actually used; and (3) bequeathal value placed on knowing a fish population, habitat, or ecosystem is protected for the benefit of future generations. Offsite nonconsumptive uses of resources are public in nature in that no one is excluded from deriving the identified benefits, and one person's enjoyment does not affect another's potential benefit.

The existence of coastal fishing communities in themselves may have intrinsic social value. For example, the Newport Beach (California) dory fishing fleet, founded in 1891, is a historical landmark designated by the Newport Beach Historical Society. The city grants the dory fleet use of the public beach in return for the business and tourism this unique fishery generates.

Value may also be placed on biological diversity. The value of biological diversity may be part of the total value placed on a site by nonconsumptive users (onsite or offsite). Three levels of biological diversity have been identified, (1) genetic diversity within a species, (2) species diversity (richness, abundance, and taxonomic diversity), and (3) ecosystem diversity. Ecosystem diversity encompasses the variety of habitats, biotic communities, and ecological processes (Caribbean Fishery Management Council 1998). Healthy ecosystems characterized by high biological diversity are generally able to provide a wider range of ecosystem services than are available from damaged or less diverse ecological communities. Examples of such ecosystem services include the nutrient recycling and filtering capabilities of wetlands, and the CO_2 sequestration function provided by the ocean (which is an important carbon sink).

The total societal value placed on offsite nonconsumptive use of a stock or component of the ecosystem will also depend on: (1) the size of the human population, (2) the level of income, (3) education levels, and (4) environmental perceptions and preferences (Caribbean Fishery Management Council 1998).

The above relationships imply that as human populations and the affluence of those populations increase, and as fish stocks and their ecosystems are depleted, nonconsumptive values associated with maintaining ocean resources are likely to increase. Another implication of these relationships is that once the basic integrity of ecosystem processes and marine fisheries components are preserved, the likely additional benefit from incremental increases biomass will decrease.

Non-Consumptive Users

7.1.5 Fishing Communities

Figure 7-4 and Table 7-47 are provide to the reader as aids in for reviewing references to ports, communities, counties, and recreational areas.

The Magnuson Stevens Act requires among other things that the time period for rebuilding an overfished species "be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem;…"

7.1.5.1 Community Descriptions

Many documents were used to develop the discussion found in this section. For more detail on the relationship of bycatch species to fisheries sector, port and community, the reader is directed to the attached: "Economic Revenue and Distributional Impacts Associated with Overfished Species Management in West Coast Commercial Groundfish Fisheries" In addition the reader is directed to Tables 7-4a and 7-4b. For additional reference, Section 8.1.6 of the 2005-2006 EIS and its associated Chapter 8 of Appendix-A contains information on fishing communities as well. For a much more expansive discussion of fishing communities, the reader is referred to the NMFS Northwest Fisheries Science Center website where detailed descriptions of fishing communities: http://www.nwfsc.noaa.gov/research/divisions/sd/communityprofiles/index.cfm. The reader is also referred to the Environmental Justice discussion found below, which contains a discussion of identifying communities of concern with respect to minority and low income populations.

In addition to this data, PacFIN data tables developed by NMFS SWFSC that describe by port and sector, the number of dealers, vessels, revenues, landings, vessel trips were used to develop the groundfish sector summaries found in Attachment 7-3 To synthesize the information found in all of the tables described above, the key analysis done for this EIS is the Fishing Community Engagement, Dependence, Resilience and Identification of Potentially Vulnerable Communities which is also attached.(Attachment 7-4of Appendix?) The key results of this study follow.

7.1.5.2 Fishing Community Engagement, Dependence, Resilience and Identification of Potentially Vulnerable Communities

To help the Council with determining the needs of fishing communities, numerous indicators were developed to characterize and rank communities and counties to the degree that a community or county was:

"engaged"—level of involvement in fishing
"dependent"—involved in the groundfish fishery
"resilient"—able to adapt to change
"vulnerable"—"highly dependent" and "having low resilience"
"most vulnerable" – "highest dependence" and "least resilient"

The methodology and results are presented in Attachment 7-4; Attachment 7-4 contains the following tables;

Table 1. Socioeconomic and cultural indicators
Table 2. Determining dependence
Table 3. Methodologies used in past research to identify dependence
Table 4. Determining resilience
Table 5. Linking dependence and resilience to identify vulnerable areas
Table 6. Distressed areas
Table 7. Commercial indicators and rankings city
Table 8. Commercial indicators and rankings by county
Table 9. Commercial fishing engagement scores by city
Table 10. Commercial fishing engagement scores by county
Table 11. Groundfish dependency scores by city
Table 12. Groundfish dependency scores by county
Table 13. California charter vessels ranked by region
Table 14. California recreational indicator values and rankings by region
Table 15. Oregon and Washington recreational indicator values and rankings by city
Table 16. California recreational engagement scores by region
Table 17. Oregon and Washington recreational engagement scores by city
Table 18. Resiliency indicator values and rankings by city
Table 19. Resiliency indicator values and rankings by county
Table 20. Resiliency scores by city
Table 21. Resiliency scores by county
Table 22. Commercial and recreational scores and identification of vulnerable cities
Table 23. Commercial and recreational scores and identification of vulnerable counties

Below are the conclusions of the study.

7.1.5.2.1 Vulnerable Commercial Communities and Counties

With regard to engagement in commercial fishing, twenty-nine cities are identified as "vulnerable" or "most vulnerable" areas. The "most vulnerable" area label indicates the highest levels of engagement (or dependence) and the lowest levels of resilience. Ilwaco and Moss Landing are most vulnerable with regards to engagement in commercial fishing. Ilwaco and Moss Landing have the highest levels of engagement in fishing (score of four and three, respectively) and resiliency (score of three and four, respectively). Other vulnerable areas include Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Ilwaco, Moss Landing, Port Orford, Santa Cruz and Winchester. All have high fishing engagement scores (two or greater) and low resiliency scores (two or greater). Newport, San Pedro and Westport all have high fishing engagement (score of four) but lower resiliency scores (score of one).

With regard to dependency on the commercial groundfish fishery, thirty-two cities are identified as vulnerable areas. Neah Bay is identified as a most vulnerable area. Other vulnerable areas include Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Moss Landing, Pacific City, and Port Orford. All have high groundfish dependency scores (two or greater) and low resiliency scores (two or greater). Morro Bay, Newport, and Oceanside all have high groundfish dependency (score of three) but lower resiliency scores (score of one). Chinook, Garibaldi, La Push, and Ilwaco all have higher groundfish dependence (score of one) and the lowest resiliency scores (three or more). Several vulnerable areas that are cities are identified as highly engaged and highly dependent (see Table 22).

Astoria, Garibaldi, Gold Beach, and Westport rank in all city categories: commercial and recreational engagement and dependency as well as low resiliency.

Sixteen counties are identified as vulnerable areas with regards to commercial fishing engagement. Six counties are labeled as most vulnerable areas and include Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific counties. All have high commercial fishing engagement scores (three or more) and low resiliency scores (three or more). Grays Harbor and Lincoln counties score highest in fishing engagement (scores of four) and lowest in resiliency (scores of four).

Seventeen counties are identified as vulnerable areas with regard to groundfish dependence. Clatsop, Coos, Curry, Grays Harbor, Lincoln, and Los Angeles counties score as most highly dependent (scores of two or more) and least resilient (scores of two or more). Several vulnerable areas that are counties are identified as highly engaged and highly dependent (see Table 23).

7.1.5.2.2 Recreational fishery

Ten cities are identified as vulnerable areas with regard to recreational fishing in Oregon and Washington. These cities are bolded in Table 22 under the recreational column. Astoria, Depoe Bay, and Garibaldi are all highly engaged in the recreational fishery (score of two or more) and least resilient (score of two or more). Garibaldi is the only city labeled as “most vulnerable” due to its high scores in both engagement/dependence on recreational fisheries and low resiliency.

Other recreational vulnerable cities include Gold Beach, La Push, Neah Bay, Newport, Pacific City, Westport, and Winchester. Newport has very high score in recreational engagement (score of five) but a lower resiliency score (score of one). La Push, Neah Bay and Winchester all have lower recreational engagement scores (scores of one) but very low resiliency scores (score of four or more).

It was not possible to identify recreationally engaged vulnerable areas in California due to the two-county and regional level recreational data that was available with regard to recreational fishing, compared to city and county level data available for the resiliency indicators. However, we were able to identify some California communities as potential vulnerable areas based on commercial engagement in and dependency on the groundfish fishery. Table 16 shows that San Luis Obispo through Santa Cruz counties and San Diego through Los Angeles counties are most engaged in recreational fishing and dependent on the groundfish recreational fishery. Los Angeles, San Luis Obispo and Santa Barbara counties are all ranked as least resilient in Table 23.

7.1.5.2.3 Summary

In summary, thirty-eight cities and eighteen counties are identified as commercial and/or recreational vulnerable areas (areas with high engagement or dependence on commercial or recreational fisheries and low resilience to change). Tables 22 and 23 display the results of the analysis. To qualify as a vulnerable area, a city or county must be listed in the top one-third of ranked indicator values for at least one engagement or dependency indicator and one resiliency indicator. When stricter ranking requirements are applied so that a community has to be ranked in the top one-third of an indicator twice under engagement and/or dependence and resilience, a smaller pool of cities and counties qualify. These seventeen cities include Astoria, Bellingham, Bodega Bay, Coos Bay, Crescent City, Depoe Bay, Eureka, Fort Bragg, Garibaldi, Ilwaco, Moss Landing, Neah Bay, Newport, Pacific City, Port Orford, Santa Cruz, and Winchester Bay. The fifteen counties include: Clatsop, Coos, Curry, Del Norte, Grays Harbor, Humboldt, Lincoln, Los Angeles, Mendocino, Monterey, Pacific, San Luis Obispo, Tillamook, Wahkiakum, and Whatcom counties. If even stricter ranking requirements are applied so that a community must be ranked in the top one-third of an indicator three times under engagement and/or dependence and resilience, four cities and six counties are identified as vulnerable. These cities and counties are labeled "most vulnerable". The cities include: Garibaldi, Ilwaco, Moss Landing, and Neah Bay. The counties include: Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific counties.

7.1.5.3 Environmental Justice Communities of Concern

This Section repeats the discussion found in The final EIS for the 2005-06 specification document {PFMC (Pacific Fishery Management Council) 2005?DBD Final Environmental Impact Statement for the Proposed Groundfish Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-06 Pacific Coast Groundfish Fishery. Pacific Fishery Management Council. Portland, OR, January 2005? DBD}

Environmental Justice Considerations

7.1.5.3.1 Identifying Communities of Concern

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires federal agencies to identify and address "disproportionately high adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations in the United States." Fishery management actions promulgated by the Pacific Council and implemented by NMFS can have environmental and socioeconomic impacts over a very wide area; the affected area of many actions covers all West Coast waters and adjacent coastal communities involved in fishing. This makes it difficult to identify minority and low-income populations that may be disproportionately affected.

Section 8.5 in Appendix A (PFMC, 2005) describes a methodology, using 2000 U.S. Census data, to identify potential "communities of concern" because their populations have a lower income or a higher proportion of minorities than comparable communities in their region. West Coast ports identified in the PacFIN database were examined in this way. These ports were evaluated using five criteria: the percentage nonwhite population, percentage Native American population, percentage Hispanic population, average income, and the poverty rate. Data were evaluated for both census places and census block groups corresponding to the area around these census places. The values for these statistics were compared to the average value for one of three regions, covering coastal block groups in Washington, Oregon, and northern California; central California; and southern California. For each of the five statistics potential communities of concern were identified. These are communities that have a significantly higher percentage minority population and poverty rate or lower average income than the surrounding reference region.

About two-thirds of the port communities analyzed are above the cutoff threshold for one or more of the statistics, measured either by the census place value or the equivalent block groups. This suggests that additional criteria need to be applied to more realistically identify which ports should be of concern. It should be noted that the population affected by the proposed action, which would be predominantly fishers and those involved in allied industries (e.g., marine supplies, fish processing, recreational charter and equipment) is a small percentage of the population in most communities. It stands to reason that in larger communities and more urban areas, fishery participants are a smaller and potentially less representative component of the population. In isolated rural communities there are usually fewer alternative employment alternatives, making it harder to find work or switch from one occupation to another in response to changes in one economic sector such as fisheries. Given these conditions, another criterion to focus on communities of concern would be population size and urbanization. Eliminating ports with a population greater than 50,000 and of those ports with a population less than 50,000, those for which the block group area is more than 75% urban leaves the following ports as potential communities of concern:

It should be noted that fishery participants usually make up a small component of the population and fisheries may be a small part of the local economy in many places. Thus, even if a community has a high proportion of minority or low income residents, these people might not participate in fisheries and are thus minimally affected by the proposed action. Furthermore, within the affected population some segments are more likely to be low income and minority than others. For example, employees in a fishing processing plant may be predominantly from a minority group, and crew on vessels are likely to have a lower earnings than the skipper or vessel owner, making them more likely to be low income. Unfortunately, the kind of detailed population data necessary to determine the characteristics of the population affected by the proposed action are not available. For this reason, the ports identified in Table 7-48 represent an initial screening. Note that Moss Landing, Port Orford, Neah Bay, and Winchester Bay are also described as “vulnerable communities” (see 7.1.5.2.3).

7.2 The Economic Impacts of the Alternatives

7.2.1 Introduction

7.2.1.1 Criteria Used to Evaluate Impacts

When an agency is evaluating reasonably foreseeable significant adverse effects, there is incomplete or unavailable information, and the costs of obtaining it are exorbitant or the means unknown, the agency must (1) so state, (2) describe the importance of the unavailable information to the assessment, (3) summarize any existing scientific information, and (4) evaluate impacts based on generally accepted scientific principals, which may accord with the best professional judgment of agency staff (40 CFR Part 1502.22). NMFS acknowledges that the information necessary to fully evaluate net national benefits associated with socio-economic impacts described below cannot be reasonably obtained at this time. Available information includes historic data on commercial vessel landings and exvessel revenue gleaned from fish tickets, projections of limited entry trawl vessel participation (landings and revenue) under the alternatives provided by the GMT's trawl bycatch model, rough projections of nontrawl fisheries response (landings and revenue) under the alternatives produced by the Council's commercial fisheries data model, tribal fisheries projections (landings and revenue) under the alternatives provided by the GMT, estimates of recreational angler trips in recent years and under the alternatives provided by the GMT, and estimates of local personal income and employment impacts resulting under the alternatives generated using the Council's commercial and recreational fisheries economic assessment models (FEAM)[1/].

Additional information that is necessary to perform the required net benefits analysis includes production cost information for vessels; production cost, product volume and price information for processors; trip cost, trip volume and price information for charter operators; and angler willingness to pay information for recreational fishing experience. As noted below, efforts are underway to collect representative production cost information from participating commercial fishing vessels. However that information will not be available in time for use in this analysis, nor will the other information mentioned in this paragraph. Therefore the following evaluation is based on best professional judgment of NMFS and Council staff.

7.2.2 Commercial Fisheries

Changes in exvessel revenue are used to indicate the directions of change expected in net economic benefits derived from harvest by the commercial seafood vessels. Subgroups of the groundfish fleet are examined to determine if any particular group is experiencing greater effects than others. The primary divisions are between the limited entry trawl, limited entry fixed gear and open access fishery.

A complete assessment of the expected change in net revenue requires an assessment of changes in fishing costs[1/]. Comprehensive information on fishing costs for the West Coast groundfish fishery is not currently available. An effort is underway by NMFS and PSMFC to fill this gap by collecting data on fixed and variable cost structures of vessels engaged in groundfish and other major West Coast fisheries. A simple analysis of expected change in vessel cost structure associated with implementation of selective flatfish trawl fishery is included. Changes in operational flexibility resulting from regulatory constraints will be addressed qualitatively as an indicator of impacts on production costs. Effects on human health and safety will be discussed primarily in terms of the effect of revenue changes on vessel maintenance and the effect of changes in the RCA on travel distances to fishing ports.

The discussion of cumulative impacts will include the effects of the trawl vessel buyback program and possible future implementation of an ITQ program. These regulatory changes will be discussed in terms of their likely effects on vessel revenue and operational costs. Changes in revenue will also be used as an indicator of the magnitude of likely harvest pressure that may affect adjacent fisheries as a result of changes in opportunity in the groundfish fishery.

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[23]/ FEAM includes estimates of industry (commercial vessels, processors and recreational angling businesses) cost and output parameters that have been adopted from informal surveys over the past 20 years. The Council's economic modeling methodologies are discussed in Appendix D of 2005-2006 EIS.

[24]/ In order to estimate net economic benefits, fishing costs must be adjusted by appropriate shadow prices to determine real opportunity costs. For example, expenditures for crew would not count as an economic opportunity cost if the labor would otherwise have been unemployed. Or if the labor would have been employed, but at a lower wage, then the difference between the wages in the fishery and the wage in the next best alternative employment would not be counted as an economic cost (i.e., only the next best available wage is counted as a cost).

7.2.3 Buyers, Processors, and Seafood Markets

Due to the lack of data on prices, costs and profitability of buyers and processors, much the same indicators as used for the harvesting sectors are used for comparing impacts on the buyer/processing sector. Specifically, as a proxy for profits, exvessel revenue is used as an indicator of activity level. From the buyer's' perspective, exvessel revenue represents expenditures for a primary production input. Projected change in exvessel revenue under the alternatives can be stratified by different categories to examine impacts by buyer/processors' relative size and level of involvement in or dependence on groundfish purchases.

Substitutability of other products, or the same product imported from elsewhere, greatly affects regional seafood markets. Flatfish are generally lower priced than rockfish, and production is more constrained by markets than by availability of the resource itself. Rockfish are higher priced in West Coast fresh markets. However, similar products from South America, Mexico, Canada, and Alaska readily substitute for West Coast production. Whiting, which is processed into surimi, a generic fish product, competes with other sources of supply such as Alaska pollock.

7.2.4 Tribal Fisheries

The criteria used to compare 2005-2006 management alternatives for the tribal groundfish fisheries are total annual projected groundfish landings and resulting exvessel revenue.

7.2.5 Recreational Fisheries

7.2.5.1 Private Recreational Anglers

Recreational experiences generate economic value for individual anglers, as determined by their willingness to pay for the experience. The sum of anglers' net willingness to pay (minus actual expenditures) represents the net economic value contributed by the recreational fishery to the national economy. However estimates of these parameters are not currently available. As a proxy, partial estimates of the change in total trips and indicators of the probable direction and degree of change in the average value per trip are considered. The following discussion highlights some of the issues involved in estimating the net economic value of the recreational fishing experience.

7.2.5.1.1 Estimating Net Economic Value

The net value of a recreational fishing trip is a function of the willingness of potential anglers to pay for the experience.[1/] While expected catch (species, number and size) probably doesn't affect the value of a trip once it is undertaken, it may affect the likelihood of taking a given trip in the first place. Reduced bag limits, while reducing the number of trips per time period, may also allow for a longer season and an increased total number of angler trips. This could provide angling opportunities to a greater number of anglers, potentially increasing the marginal value of each fish. While the marginal value per angler of each additional fish caught decreases with increasing bag limits, so too does the cost per unit of catch. So the net effect of a change in bag limit on the value of recreational experiences is ambiguous.

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[25]/ Arguments that might be used to estimate willingness to pay include, among others, attractiveness of the location and distance traveled by the fisher.

While a loss of fishing opportunity may translate into a direct reduction in trip-related expenditures, the resulting change in net economic value will be considerably less than the change in expenditure. Presumably the recreationalist will still pursue another activity, even though this alternative experience may be somewhat inferior than what the person originally had in mind. Substitution of one activity for another in time and/or place may still involve a similar level of expenditures, although not of the same kind or necessarily in the same place. While analysis of the local impact would interpret the reduction in revenue of the recreational fishing-related businesses as a direct loss in local income, analysis of net economic value would treat only the difference in the intrinsic value to the individual between the two types of experience as a net change in value.

An ideal model would allow us to measure the effect on total recreational effort (quantity and location of trips) and marginal value per trip resulting from changes in different management variables. Unfortunately, the data to populate such a model are lacking because the specific surveys to collect the required data have not been done.

7.2.5.1.2 Change in Recreational Effort

Conceptually, effort may change in response to caps on total landings (although if a cap is non-binding it may have no direct effect), change in seasons, or change in area or depth closures. Estimates of the change in the number of angler trips in each state's recreational ocean fishery under each management alternative are derived. Also considered are the proposed closure periods compared with the seasonal effort pattern observed, and the effect of shifts in the inshore closed area under the alternatives.

It should be noted that these estimates probably do not adequately project the effect of management changes on the distribution of effort, nor do they incorporate the impact of other changes on demand for recreational fishing experience. However this is the best available approach for evaluating impacts given the data limitations.

7.2.5.1.3 Change in Quality (Value) of Trips

Management measures may affect the perceived value of the recreational experience as well as the amount of effort. Those anglers forced to change their desired fishing patterns will probably experience a reduction in economic value from the trip. While change in bag limits probably does affect the decision of whether or not to fish, historically West Coast groundfish managers have observed little change in recreational effort in response to changes in bag limits. However continued reductions in bag limits would be expected to eventually lead to reduced demand and lower levels of angler participation once some critical threshold had been crossed.

7.2.5.1.4 Change in Quantity of Trips

Greater restrictions (e.g., lower bag limits) on individual trips may allow a greater number of anglers to fish by spreading the recreational harvest out over a longer season. However if current bag limits are constraining retained catch, then lower bag limits may also reduce the likelihood that a given individual will choose to go fishing in the first place. An increase in the number of trips results in increased total expenditures by recreational anglers. However, especially in the short term, these expenditures may represent dollars taken away from other places and other types of activities rather than "new" activity. Therefore even though net benefits may be unchanged, there may be a redistribution of expenditures among local businesses.

7.2.5.2 Charter Boat Businesses

Demand for charter trips is affected by some of the same factors that affect demand for private recreational fisheries, including bag limits, weather conditions during open seasons, and coincidental timing of open seasons with traditional vacation periods. For example, a closure during the months of July and August, the peak summer vacation period, will have a more adverse impact on charter operators than will closures during any other two-month period of the year. Impacts on charter boats under the alternatives are assessed based on estimated changes in total effort and timing of closure periods.

7.2.6 General Public

Directly measuring individuals' nonconsumptive and nonuse values for a marine resource is beyond the scope of this analysis. The metric used as a proxy is relative size of the RCAs. At current relative biomass levels for sensitive fish species this measure is assumed to be proportional to enhanced nonconsumptive and nonuse values.

7.2.7 Communities

Impacts on communities will be assessed according to the commercial and recreational impacts described below. “Vulnerable” communities will be also discussed.

7.2.7.1 Commercial Fisheries and Recreational Impacts

Projected commercial landings under the alternatives are compared against recent landings to estimate change in landings by port area. Income multipliers generated by the FEAM and differentiated by species, vessel category, gear type, processing mode, and landing port are applied to the projected landings to estimate change in total personal income impacts resulting from the estimated change in harvest and processing activity under each alternative. A description of FEAM is found in {Jensen 1996}. A recent update to the model is described in {Davis 2003}. Also see Appendix D of the 2005-06 EIS for further discussion of income impact estimating methodology. These impacts will be reviewed against the list of “vulnerable communities as described above.” Annual recreational fishing effort under the alternatives is estimated by region and compared against recent data. Change in effort is assumed to be roughly proportional to the change in estimated harvest. Regional income multipliers derived from the recreational FEAM, and average trip expenditures for recreational fishers in the four regions derived from a recent study {Gentner 2001} are applied to the estimated change in effort to generate the change in regional income resulting from the level of recreational fishing activity expected under each alternative.

7.2.7.2 Community Vulnerability

The commercial and recreational impacts will be compared against the list of “vulnerable” communities and “communities of concern”—see discussion under 7.1.5.2.

7.2.7.3 Safety

Changes in vessel net income can have effects beyond economic effects. Reduced investment in maintenance and safety equipment can increase hazard associated with fishing. Reduced income opportunity could cause dislocation for crew members and their families. Individuals willing to work for lower paying jobs are generally less skilled and have fewer alternative employment opportunities. In addition to reduced operational efficiency, these factors could lead to deterioration in vessel safety conditions.

Safety of fishing vessels is also affected by the seasons and depth zones or areas open to fishing under the alternatives. Seasonal closures that push commercial and/or recreational vessels out to sea during poor weather months will increase the likelihood of safety problems for those vessels.

RCA boundaries and depth or area closures that pack vessels into shallow nearshore areas will also increase the likelihood of safety problems. Limits that push commercial and recreational fleets to fish in the same waters increase the risk of collisions, especially in bad weather. Recreational boaters tend to be less experienced and have less safety equipment than commercial skippers, and are often unfamiliar with bottom contours, wave dynamics, tides, and currents. This combination of increased vessel density, the inherent risks of navigating shallow waters, and relatively inexperienced skippers, increases the risks to vessels.

Effects on vessel safety under the alternatives are evaluated by comparing revenue earning opportunities for commercial vessels, and the pattern of season and depth/area closures for both commercial and recreational vessels.

7.2.7.4 Key Impact Indicators

As discussed above assessing the impacts of the alternatives will be primarily through the prediction of changes in landings, ex-vessel revenues, and personal income impacts for commercial fisheries. Total estimates are provided by Alternative and then by sector and community (e.g. Shoreside Limited Entry Trawl, Astoria Tillamook) and by state. For recreational fisheries, the key indicators are trips, angler expenditures and income impacts. In evaluating the alternatives, two different approaches are undertaken. The first approach attempts to develop ex-vessel impact estimates on a on a finer scale with respect to gear groups and fisheries than the second approach. The second approach provides information on personal income and other variables. Both discuss recreational fisheries

First Approach –A: Commercial sectors are nearshore groundfish, limited entry trawl, whiting, fixed gear sablefish north of the Conception area, fixed gear south of Point Conception, and Total. The First Approach uses 2005 as a reference point. Whereas the Second approach uses the No-Action Alternative as a reference point.

Second Approach –B: Commercial sectors are Limited Entry trawl (including or excluding whiting), tribal shoreside, tribal at sea, open access groundfish, and total limited entry sablefish.

The methodology and groupings of tribal and commercial sectors differs slightly between each approach, but recreational fisheries are analyzed the same way. Approach B provides commercial estimates and projections by alternatives on landing, revenues, and personal income and recreational estimates and projections of trips, angler expenditures, and personal income. Approach A provides estimates of ex-vessel values and recreational trips. Approach B provides information on a port and community basis; Approach A provides information on a regional basis. Approach A analyzes the five rebuilding alternatives discussed in Chapter 2 and brought before the Council in April. Approach B focuses only the three action alternatives, the no action alternative, and provides estimates of 05 and 06. Approach A does not address O6 or the no-action alternative; however, it does address the "No Fishing" option.

For this document, both analyses will be used. Because it addresses the link between management and economic impact, Approach A Analyses will be used to walk through the alternatives. This discussion will then be followed by a summary of the Second Approach's estimates.

Since both approaches discuss the Action Alternatives, Table 7-49 has been developed to provide the reader with a quick reference to the major changes in OYs from 05-06 levels.

7.2.8 Economic Impact of Management Measures Designed to Achieve the OY Alternatives—Discussion of Approach A

This section discusses the economic impact of management measures that were designed and analyzed with the intention of achieving the OYs described in chapter 2 of this EIS. The alternatives discussed in chapter 2 show a set of alternatives originally considered during the winter of 2006 which led to the council's selection of preliminary preferred alternatives for target species, and a high and low preliminary preferred alternative for rebuilding species. The initial set of OY alternatives pertaining to overfished species described in chapter 2 are referred to here as "rebuilding alternatives" and the second set of alternatives that were selected by the council during the April 2006 meeting are referred to as "preliminary preferred alternatives" or "action alternatives". The action alternatives focus on the council's preliminary preferred OYs for target and rebuilding species. While the council may continue to consider, and ultimately adopt, one or more of the rebuilding alternatives not considered a preliminary preferred alternative, this analysis concentrates on the action alternatives based on the notion that the council has given an indication as to what OYs it feels are close to those it wishes to adopt.

7.2.8.1 Overview

The OYs for target and rebuilding species differ from 2005 and 2006 OYs. In some cases these differences are substantial, and in other cases the difference in minimal. The relative OYs of target and rebuilding species ultimately influences the management measures that are crafted in response to those OYs, and estimates of exvessel revenue, recreational effort, and the distribution and source of those economic effects differ in response.

For the 2007 and 2008 season, the OY of several key target species will differ relative to the 2005 and 2006 season. The OYs for Dover sole, English sole, and shortspine thornyheads will increase substantially based on the council's preliminary preferred alternative (Table 7-49). In response, management measures could be crafted which allow fisheries to harvest more of these species, however, the take of these target species is constrained by rebuilding species, and in some cases, other target species. Some target species will have a decrease in the OY compared to the OYs that were in place for 2005 and 2006. Petrale sole and sablefish for example will have a 22% and 10% reduction respectively, and these OYs are expected to constrain the take of other target species to some degree under the council's preliminary preferred alternatives 2 and 3.

The OY for rebuilding species differ from 2006. Under action alternative 1, all OYs are reduced compared to 2006 levels. Under action alternative 2 and 3, the OY of most overfished species are reduced compared to 2006 levels, but the OY for widow, cowcod, and darkblotched would increase. However, the OY for darkblotched is equivalent to 2006 levels when the OY is measured relative to the size of stock biomass, and analysis shows that this OY is expected to constrain some fisheries more than the 2006 OY based on expectations pertaining to increases in the bycatch rate of darkblotched.

Table 7-49 provides information on the difference and change in OYs for rebuilding species and some of the key target species. This information is useful for showing why exvessel revenue can change under some of the alternatives, the source for those changes, and insight into some of the management responses anticipated to stay within the OY that is ultimately adopted by the council.

A summary comparison of exvessel revenue calculations by sector and alternative provides a glance of the economic impacts of each alternative (Table 7-50). Compared to coastwide 2005 exvessel revenues generated by commercial vessels in directed groundfish sectors, action alternative 3 has the least degree of difference, action alternative 1 has the largest degree of difference, and action alternative 2 is best described as more moderate. The five rebuilding alternatives originally analyzed range from exvessel revenues that are slightly higher than status quo, to revenues that are slightly lower than action alternative 1. On a sector specific basis, all alternatives negatively impact the fixed gear sablefish sector because the OY for sablefish is lower in 2007 and 2008 compared to 2005 and 2006. The nearshore groundfish sector is most impacted by action alternative 1, least impacted by action alternative 3, and more moderately impacted by action alternative 2. The LE bottom trawl sector is most impacted by action alternative 1, has slightly higher revenues than status quo under action alternative 2, and even higher revenues under action alternative 3. The LE whiting sector is most negatively impacted by action alternative 1, but action alternative 3 allows this sector to attain higher revenues than status quo if the whiting OY allows those catch levels to be attained[26]. Action alternative 2 constrains the whiting sector to revenues that are somewhat less than status quo. Fixed gear fisheries south of point Conception are negatively impacted by action alternative 1, but remain at status quo for action alternatives 2 and 3.

Table 7-51 does a similar analysis for recreational fisheries. Action Alternative 3 leads to an increase in recreational effort over 2005 levels while Action Alternative 1 shows a 35 % decline in angler trips and Alternative 2, a 22% decline.

7.2.8.2 Action Alternative 1

Action alternative 1 reduces overfished species OYs compared to status quo catch levels, and as a result, revenues generated by commercial and recreational fisheries are reduced compared to 2005 levels. Under this alternative, many of the target species OYs are not attained, and fishing area is decreased for all sectors as the size of groundfish conservation areas is expanded to encompass more area where overfished species are found. While groundfish conservation areas are a useful tool for protecting overfished species while allowing fishing opportunity where those same overfished species are less abundant, having less fishing area makes it more difficult to access target species in many cases, and may also increase the cost of traveling to areas remaining open.

7.2.8.2.1 Impacts to Limited Entry Bottom Trawl

The impacts to the non-whiting limited entry trawl sector under action alternative 1 are largely driven by the OYs for canary rockfish, bocaccio rockfish, darkblotched rockfish, cowcod, and Pacific ocean perch. While the OYs for yelloweye and widow rockfish are also reduced under action alternative 1, the non-whiting limited entry trawl sector does not encounter these species to the same degree as other sectors

[26] The Pacific whiting ABC and OY levels are estimated and adopted by the Council in the spring of each year.

and therefore the management measures crafted for this sector are not driven by those species.

Regulations for the non-whiting limited entry trawl sector include an expansion of the trawl rockfish conservation area compared to status quo, and a decrease in cumulative limits for target species compared to status quo. Of particular note, this alternative puts in place a 250 fathom seaward boundary in the northern areas (north of 40° 10 minutes N latitude) for the entire year, a 200 fathom seaward boundary in the area between 40° 10 minutes N latitude and 38° N latitude for the entire year, and a 60 fathom shoreward boundary for areas south of 40° 10 minutes N latitude for most of the year. This is a noticeable reduction in fishing area compared to 2006 configurations.

Cumulative limits for target species under this alternative are reduced for all of the major target species including Dover sole, sablefish, thornyheads, other flatfish, arrowtooth flounder, and petrale sole. As a result, none of the OYs for major target species are attained under this alternative.

The combined effect of area closures and reductions in cumulative limits results in a decrease in exvessel revenues from the no-action alternative. Exvessel revenues to this sector are approximately 59% of 2005 levels, representing a decrease of approximately 41% (Table 7-50). Table 7-52 shows projected revenues by two month period.

7.2.8.2.2 Impacts to the Limited Entry Whiting Trawl Fishery

The impacts to the limited entry whiting trawl sector under action alternative 1 are largely driven by the OYs for canary rockfish, widow rockfish, and to a lesser extent, darkblotched rockfish and Pacific ocean perch. Other species are not caught in the whiting sectors to the same degree as other sectors, so management measures necessary to protect species such as bocaccio, yelloweye, and cowcod do not influence the whiting fishery to the same degree as other sectors.

While many sectors benefit from the use of groundfish conservation areas, or more specifically, the rockfish conservation areas, it is estimated that the whiting sector would not benefit as much from imposing a rockfish conservation area in the same manner as the bottom trawl sector. Depths restrictions necessary to achieve reductions in the catch of canary, widow, darkblotched, and POP are generally the same depths where Pacific whiting are found and caught effectively. Closing these areas would also eliminate the ability to target whiting effectively, except in the years of largest whiting abundance when the population is spread more densely over a wider range of depths. Therefore, the most effective means of reducing the bycatch of overfished species in this sector while continuing to allow a fishery is likely to be a decrease in the amount of whiting catch allowed to the commercial sectors. Assuming the whiting sector is allowed to take the same percentage of the widow, canary, darkblotched, and POP OYs as under the 2005 and 2006 fisheries, it is estimated that the commercial catch amounts and exvessel value of Pacific whiting would decrease by 42.5% (Table 7-50) Table 7-53 shows projected revenues by two month period.

7.2.8.2.3 Impacts to Nearshore Groundfish Fisheries

Economic impacts to the nearshore groundfish sector are largely driven by canary and yelloweye rockfish. In areas south of 40° 10 minutes N latitude, observer data has not shown an interaction with yelloweye rockfish, so in these areas, canary rockfish is the driving constraint. Action alternative 1 brings the nearshore groundfish sectors in to depths less than 20 fathoms for the entire year. Depth restrictions are regarded as a useful tool for managing the catch of overfished species in the nearshore groundfish sectors while allowing fishing of healthy target species, however, imposing a more restrictive depth restriction is expected to result in some reduction in the catch of target species as some nearshore target species are not as available at depths less than 20 fathoms. Although some reduction in the catch of target species is expected from a 20 fathom restriction, additional reductions on some of the lesser valued target species are were analyzed under this alternative to achieve the necessary reductions in the bycatch of canary and yelloweye rockfish. Analysis of alternative 1 shows that exvessel revenues are expected to decline by approximately $450,000 from 2005 levels which represents a decrease of approximately 16.5% (Tables 7-50, 7-54).

7.2.8.2.4 Impacts to Fixed Gear Sablefish Sectors North of 36° North Latitude

Economic impacts to the fixed gear sablefish sectors are largely driven by yelloweye and, to a lesser extent, canary rockfish. Management measures designed to reduce the bycatch of these species in the fixed gear sablefish sectors are limited to depth restrictions of varying degrees of restrictiveness depending on the alternative. Changes in the catch of sablefish which are lower than the OY are not considered in the management measures which pertain to reductions in the catch of overfished species because under all alternatives the sablefish OY is reduced compared to 2005 and 2006 levels, and this reduction achieves reductions in the bycatch of overfished species on it's own. The reduction in the sablefish OY occurs as a result of the 2005 sablefish stock assessment, and the council's policies regarding species that fall within the precautionary zone (sablefish is a precautionary zone species).

While exvessel revenues are expected to be the same across all action alternatives ($8.7 million, Table 7-50), action alternative 1 is expected to have a substantial impact to vessels that home port near the northern Washington coast and Puget Sound. Under action alternative 1, the fixed gear sablefish sectors would be restricted to fishing deeper than depths of 150 fathoms, and off the northern Washington coast, the 150 fathom line closes off most of the fishing grounds currently used by those vessels. Imposing a 150 fathom line would require vessels that home port in the northern Washington ports and Puget Sound ports to travel much further distances to reach fishing grounds. This may result in increased travel cost, or some vessels may choose to change their homeport, thereby affecting processors and support businesses relying on vessels in their current home ports in the northern Washington coast and Puget Sound.

7.2.8.2.5 Impacts to Groundfish Fixed Gear Sectors South of 34° 27 North Latitude

The economic impact to fixed gear fisheries operating south of point Conception are largely influenced by the OYs for bocaccio and cowcod. Depth restrictions are viewed as an effective mechanism for achieving reductions in the bycatch of overfished species in this area (primarily bocaccio and cowcod), however depth restrictions are likely to reduce the catch of target species as well since vessels in this area occasionally target species that are found in areas proposed to be closed under action alternative 1. Under status quo management measures, vessels can fish at depths less than 60 fathoms or more than 150 fathoms. Under action alternative 1, vessels would be restricted to fishing shallower than 40 fathoms or deeper than 180 fathoms. Based on the relative abundance of the main target species in the area across those depths, imposing a shoreward boundary of 40 fathoms and a seaward boundary of 180 fathoms is expected to reduce exvessel revenues by approximately $620,000, or approximately 29% compared to 2005 revenues (Table 7-50).

7.2.8.2.6 Impacts to Recreational Sectors

The impact to recreational sectors under action alternative 1 are driven by the OY for yelloweye rockfish and canary rockfish. The yelloweye rockfish OY under this alternative represents a substantial decrease in the OY from status quo levels, and management measures designed to achieve catch levels that meet this reduction in the OY are sufficient to achieve the necessary reductions in the canary rockfish OY. Management measures used to achieve the reductions in the bycatch of yelloweye rockfish include restricting recreational fisheries to 10 and 20 fathoms, reduced bag limits for target species, and shorter seasons. The coastwide impact of these management measures results in a 35% decline in recreational bottomfish fishing effort (Table 7-51).

7.2.8.3 Action Alternative 2

Action alternative 2 brings overfished species OYs to levels that are near status quo catch amounts for many overfished species except for yelloweye rockfish. When applying the portion of the OY currently being caught by status quo catch levels to the predicted biomass of overfished species in 2007 and 2008, the OYs for some overfished species under action alternative 2 are even closer to status quo catch levels. While OYs for overfished species are near status quo, negative economic impacts are less than alternative 1, but more restrictive than action alternative 3. The result is a larger portion of the OY that remains unattributed to any particular sector[27].

While many of the OYs for overfished species are not attained under this alternative, coastwide exvessel revenues are estimated to be higher for many sectors of the fishery as the population of target species such as Dover sole and petrale sole increase and become more widely found in the fishery (Table 7-50).

7.2.8.3.1 Impacts to the Limited Entry Bottom Trawl Fishery

The impacts to the non-whiting limited entry trawl sector under action alternative 2 are largely driven by the OYs for canary rockfish, bocaccio rockfish, darkblotched rockfish, cowcod, and Pacific ocean perch.

Regulations for the non-whiting limited entry trawl sector under this alternative mostly include an expansion of the trawl rockfish conservation area compared to status quo. While catch levels of overfished species are predicted to be close to status quo in this sector for many overfished species, it is predicted that the bycatch of several overfished species, darkblotched rockfish in particular, will increase over time and that rate of increase is sufficient to warrant increasing restrictions on the fishery to stay within the OY. Exvessel revenues for the bottom trawl sector are predicted to be marginally higher compared to status quo, however, the distribution of impacts is likely to be different than status quo. Under this alternative the rockfish conservation area boundaries are set at deeper depths for some periods of the year when compared to status quo, and this has impacts on vessels that are less able to fish at deeper depths because some vessels may be unable to fish in these areas, vessels may need to travel further to fishing grounds, or additional vessels may choose to fish in the nearshore areas, thus impacting small trawl vessels that routinely fish nearer to the shore. Table 7-55 provides projections of revenues by region and two month period. (Note there are no Tables 56 or 57)

[27] see chapter 2 scorecards which estimate catch of overfished species by sector and alternative.

7.2.8.3.2 Impacts to the Limited Entry Whiting Trawl Fishery

The impacts to the limited entry whiting trawl sector under action alternative 2 are largely driven by the OYs for canary rockfish and widow rockfish. While many sectors benefit from the use of groundfish conservation areas, or more specifically, the rockfish conservation areas, it is estimated that the whiting sector would not benefit as much from imposing a rockfish conservation area in the same manner as the bottom trawl sector. Depths restrictions necessary to achieve reductions in the catch of canary, widow, darkblotched, and POP are generally the same depths where Pacific whiting are found and caught effectively. Closing these areas would also eliminate the ability to target whiting effectively, except in the years of largest whiting abundance when the population is spread more densely over a wider range of depths. Therefore, the most effective means of reducing the bycatch of overfished species in this sector while continuing to allow a fishery is likely to be a decrease in the amount of whiting catch allowed to the commercial sectors. Assuming the whiting sector is allowed to take the same percentage of the widow, canary, darkblotched, and POP OYs as under the 2005 and 2006 fisheries, it is estimated that the commercial catch amounts and exvessel value of Pacific whiting would decrease by 22%. Table 7-58 shows projected revenues by two month period.

7.2.8.3.3 Impacts to Nearshore Groundfish Fisheries

Economic impacts to the nearshore groundfish sector are largely driven by canary and yelloweye rockfish. In areas south of 40° 10 minutes N latitude, observer data has not shown an interaction with yelloweye rockfish, so in these areas, canary rockfish is the driving constraint. Action alternative 2 brings the nearshore groundfish sectors in to depths less than 20 fathoms for the entire year. Depth restrictions are regarded as a useful tool for managing the catch of overfished species in the nearshore groundfish sectors while allowing fishing of healthy target species, however, imposing a more restrictive depth restriction is expected to result in some reduction in the catch of target species as some nearshore target species are not as available at depths less than 20 fathoms. While some reduction in target species catch is expected under this alternative, the catch of yet other target species that are available at these depths can be increased under this alternative compared to status quo and the impact of increasing the catch of these target species is a slight increase in exvessel revenues. Analysis of alternative 2 shows that exvessel revenues are expected to increase by approximately $90,000 from 2005 levels, but revenues are expected to decrease in the northern areas while increasing in the southern areas (Table 7-59).

7.2.8.3.4 Impacts to Fixed Gear Sablefish Sectors North of 36° North Latitude

Economic impacts to the fixed gear sablefish sectors are largely driven by yelloweye and, to a lesser extent, canary rockfish. Management measures designed to reduce the bycatch of these species in the fixed gear sablefish sectors are limited to depth restrictions of varying degrees of restrictiveness depending on the alternative. Changes in the catch of sablefish which are lower than the OY are not considered in the management measures which pertain to reductions in the catch of overfished species because under all alternatives the sablefish OY is reduced compared to 2005 and 2006 levels, and this reduction achieves reductions in the bycatch of overfished species on it's own. The reduction in the sablefish OY occurs as a result of the 2005 sablefish stock assessment, and the council's policies regarding species that fall within the precautionary zone (sablefish is a precautionary zone species).

While exvessel revenues are expected to be the same across all action alternatives ($8.7 million, Table 7-50), action alternative 2 could have a relatively large impact to vessels that home port near the northern Washington coast and Puget Sound. Under action alternative 2, the fixed gear sablefish sectors would be restricted to fishing deeper than depths of 125 fathoms in areas north of 40º 10 minutes north latitude, and off the northern Washington coast, the 125 fathom line may close off much of the fishing area currently used by those vessels. Imposing a 125 fathom line could require vessels that home port in the northern Washington ports and Puget Sound ports to travel much further distances to reach fishing grounds. This may result in increased travel cost, or some vessels may choose to change their homeport, thereby affecting processors and support businesses relying on vessels in their current home ports in the northern Washington coast and Puget Sound.

7.2.8.3.5 Impacts to Groundfish Fixed Gear Sectors South of 34° 27 North Latitude

The economic impact to fixed gear fisheries operating south of point Conception are largely influenced by the OYs for bocaccio and cowcod. While the fixed gear sectors south of point Conception encounter bocaccio and cowcod, reductions in the catch of these species necessary to stay within the OY are achieved by management measures in other sectors, and therefore, status quo management for fixed gear vessels in the area south of point Conception is sufficient to stay within the OY of overfished species.

7.2.8.3.6 Impacts to Recreational Sectors

The impact to recreational sectors under action alternative 2 are driven by the OY for yelloweye rockfish and canary rockfish. The yelloweye rockfish OY under this alternative is based on a strategy which “ramps down” catch levels from current amounts in order to give managers and industry time to adapt and develop more refined tools for decreasing the catch of yelloweye while allowing some access to healthier target species. It is anticipated that management measures designed to reduce the bycatch of yelloweye rockfish will also result in reductions of canary rockfish, and therefore, management measures which are motivated by reductions in the yelloweye OY are expected to be sufficient to achieve the necessary reductions in the canary rockfish OY. Management measures used to achieve the reductions in the bycatch of yelloweye rockfish include restricting recreational fisheries to varying depth restrictions, imposing site-specific area closures where industry and available data suggests yelloweye are found, and bag limits for target species which don’t allow attainment of target species OYs. The coastwide impact of these management measures results in a 22% decline in recreational bottomfish fishing effort (Table 7-51).

7.2.8.4 Action Alternative 3

Action alternative 3 brings overfished species OYs to levels that are near status quo catch amounts for many overfished species except for yelloweye rockfish. When applying the portion of the OY currently being caught by status quo catch levels to the predicted biomass of overfished species in 2007 and 2008, the OYs for some overfished species under action alternative 3 are even closer to status quo catch levels than action alternative 2. The overall economic impact of action alternative 3 is that many sectors are expected to be managed to levels that are similar to status quo.

7.2.8.4.1 Impacts to the Limited Entry Bottom Trawl Fishery

The impacts to the non-whiting limited entry trawl sector under action alternative 3 are largely driven by the OYs for canary rockfish, bocaccio rockfish, darkblotched rockfish, cowcod, and Pacific ocean perch. Under this alternative, the OY for petrale sole (a target species) is also expected to be attained, the OY for sablefish is expected to be nearly attained (due in large part to a decrease in the OY for sablefish), and the catch of Dover sole is expected to be higher than status quo because of the increasing abundance of this species.

Regulations for the non-whiting limited entry trawl sector under this alternative mostly include an expansion of the trawl rockfish conservation area compared to status quo. While catch levels of overfished species are predicted to be close to status quo in this sector for many overfished species, it is predicted that the bycatch of several overfished species, darkblotched rockfish in particular, will increase over time and that rate of increase is sufficient to warrant increasing restrictions on the fishery to stay within the OY. Exvessel revenues for the bottom trawl sector are predicted to be marginally higher compared to alternative 2, and higher still than status quo, however, the distribution of impacts is likely to be different than status quo. Under this alternative the rockfish conservation area boundaries are set at deeper depths for some periods of the year when compared to status quo, and this has impacts on vessels that are less able to fish at deeper depths because some vessels may be unable to fish in these areas, vessels may need to travel further to fishing grounds, or additional vessels may choose to fish in the nearshore areas, thus impacting small trawl vessels that routinely fish nearer to the shore. Table 7-60 shows projected revenues by two month period.

7.2.8.4.2 Impacts to the Limited Entry Whiting Trawl Fishery

The impacts to the limited entry whiting trawl sector under action alternative 3 are largely driven by the OYs for canary rockfish and widow rockfish, but equally driven by the ability of the whiting sectors to catch an amount of Pacific whiting which corresponds to the available OY of canary and widow rockfish. That is, under this alternative, the catch of whiting is expected to be largely unconstrained by overfished species, assuming there are no "disaster tow events" where a single tow of a trawl net catches a large amount of an overfished species. Assuming the whiting sector is allowed to take the same percentage of the widow, canary, darkblotched, and POP OYs as under the 2005 and 2006 fisheries, it is estimated that the commercial catch amounts and exvessel value of Pacific whiting would be the same as status quo, or approximately $30 million (Table 7-50) Table 7-61 shows projected revenues by two month period.

7.2.8.4.3 Impacts to Nearshore Groundfish Fisheries

Economic impacts to the nearshore groundfish sector are largely driven by canary and yelloweye rockfish. In areas south of 40° 10 minutes N latitude, observer data has not shown an interaction with yelloweye rockfish, so in these areas, canary rockfish is the driving constraint. Management measures in the nearshore fisheries under this alternative are designed to be equivalent to status quo, and therefore, exvessel revenues are expected to be the same as status quo.

7.2.8.4.4 Impacts to Fixed Gear Sablefish Sectors North of 36° North Latitude

Management measures imposed on the fixed gear sablefish sectors that are designed to reduce the catch of overfished species largely center on the impacts to yelloweye and, to a lesser extent, canary rockfish. Management measures designed to reduce the bycatch of these species in the fixed gear sablefish sectors are limited to depth restrictions of varying degrees of restrictiveness depending on the alternative. Changes in the catch of sablefish which are lower than the OY are not considered in the management measures which pertain to reductions in the catch of overfished species because under all alternatives the sablefish OY is reduced compared to 2005 and 2006 levels, and this reduction achieves reductions in the bycatch of overfished species on it's own. The reduction in the sablefish OY occurs as a result of the 2005 sablefish stock assessment, and the council's policies regarding species that fall within the precautionary zone (sablefish is a precautionary zone species).

While exvessel revenues are expected to be the same across all action alternatives ($8.7 million), action alternative 3 has the same rockfish conservation area boundaries for the sablefish sectors as under status quo, and therefore, reductions in exvessel revenue for these sectors are not driven by overfished species concerns, but are instead driven by the reduction in the OY of sablefish.

7.2.8.4.5 Impacts to Groundfish Fixed Gear Sectors South of 34° 27 North Latitude

The economic impact to fixed gear fisheries operating south of point Conception are highly influenced by the OYs for bocaccio and cowcod. While the fixed gear sectors south of point Conception encounter bocaccio and cowcod, reductions in the catch of these species necessary to stay within the OY are achieved by management measures in other sectors, and therefore, status quo management for fixed gear vessels in the area south of point Conception is sufficient to stay within the OY of overfished species.

7.2.8.4.6 Impacts to Recreational Sectors

The impact to recreational sectors under action alternative 3 are driven by the OY for yelloweye rockfish and canary rockfish. The yelloweye rockfish OY under this alternative is based on a strategy which "ramps down" catch levels from current amounts in order to give managers and industry time to adapt and develop more refined tools for decreasing the catch of yelloweye while allowing some access to healthier target species. It is anticipated that management measures designed to reduce the bycatch of yelloweye rockfish will also result in reductions of canary rockfish, and therefore, management measures which are motivated by reductions in the yelloweye OY are expected to be sufficient to achieve the necessary reductions in the canary rockfish OY. Management measures used to achieve the reductions in the bycatch of yelloweye rockfish include restricting recreational fisheries to varying depth restrictions, imposing site-specific area closures where industry and available data suggests yelloweye are found, and bag limits for target species which don't allow attainment of target species OYs. The coastwide impact of these management measures results in a 9% increase in recreational bottomfish fishing effort, though only recreational fisheries off California experience an increase in effort. Washington and Oregon are expected to achieve no change in effort under action alternative 3 when compared to status quo.

7.2.9 Net Economic Impact of Alternatives – Approach B

What follows is a walk through the tables. Table 7-62a shows projected exvessel revenue for different groupings of commercial fisheries under the alternatives, and the change in exvessel revenue relative to No Action. The table shows significant differences between the alternatives. For example, Alternative 3 has the smallest difference from No Action with a 2.7% decline associated with Alternative 3, a 10% percent decline with Alternative 2, a 37 % decline in exvessel revenues should Alternative 1 be implemented for non-tribal groundfish including at-sea vessels.

Table 7-62b shows the equivalent estimates for same groupings in terms of landed weight (thousand mt) rather than revenue while Table 7-62c does the same for comparison but using personal income impacts as the impact variable. It should be noted that “Total West Coast Landings (includes at-sea and tribal) is an estimate for all West Coast fisheries including groundfish..

Here is a list of all the commercial related tables:

7-62a Ex-vessel revenue projections by major sector
7-62b Commercial harvest projection by major sector
7-62c Commercial Income Impacts by major sector
7-63a Ex-vessel revenue projections by State, port area and major sector
7-63b Change in ex-vessel revenue projections by State, port area, and major sector
7-64a Estimated income impact projections by State, port area, and major sector
7-64b Change in estimated income impact projections by State, port area, and major sector

Recreational Fisheries Impacts

In a similar manner to those developed for the commercial fishery, the following tables have developed. Shortened titles for these tables are:

7-65a Projected recreational effort by region in 2004 and 2005 and by alternative
7-65b Change in projected effort across alternatives
7-66a Projected angler expenditures by region in 2004 and 2005 and by alternatives.
7-66b Change in projected angler expenditures across alternatives
7-67a Projected recreational income impacts by region in 2004 and 2005, and by alternatives
7-67b Change in recreational income impacts by region by alternative
7-68a Projected recreation employment impacts by region by alternative
7-68b Change in recreation employment impacts by region by area
7-68c Projected recreational Employment impacts by trip target, region, mode, state and alternative
7-68d Projected West Coast Recreational Income by state, boat type and alternative
7-68e Summary of total three State Recreational Impacts (trips, expenditures, income) by boat type and trip target.

Commercial and Recreational Fisheries Impacts Combined

7-68f Combined recreational and income impacts by region and alternative
7-68g Change in combined recreational and commercial impacts by region and alternative
7-68h Combined recreational and commercial employment impacts by region and alternative
7.59i Change in combined recreational and commercial employment impacts by region and alternative

Commercial Impact Comparison

Under the no action alternative, total West Coast landings from all fisheries including groundfish would yield 510,000 mt of fish and shellfish landed or delivered at sea, generating about $280 million in ex-vessel revenues which in turn would lead to $625 million in income impacts and at an income level of

$26,000 per year would yield 24,000 jobs. The 2005 estimates are quite similar to the No-Action Alternative. However, Alternative 1 would lead to a level $567 million in personal income, roughly a 10% decrease in income impacts whereas Alternatives 3 would have less than 1% decline in income and Alternative 3, a 4% decline. For non-tribal income impacts, the No-Action and 2005 levels of personal income are about $140 million. Implementation of Alternative 1 would lead to a decline of $56 million in groundfish fishery generated income, for a 40% decline in the groundfish fishery. Alternative 2 would lead to a 15% decline in Non-tribal income impacts including at-sea fisheries and Alternative 1, 2 percent decline.

Recreational Impact Comparison

It is estimated that under the no Action Alternative, 1.2 million angler trips would be taken and the estimated $113 million that these anglers would spend on fishing would generate, $89 million in personal income or the equivalent of 3,422 jobs. These estimates are similar to the ones generated for 2005 but differ significantly with Alternative 1. Under Alternative 1, one million trips would be undertaken leading to $92 million in expenditures, 73 million in income and 2,802 jobs. A difference of $16 million or 18 percent decline. These estimates are for all fisheries including groundfish.. With respect to groundfish targeted trips, the No action alternative leads to $40 million in personal income impacts compared to a 2005 level of $35 million. If Alternative 1 were implemented, the recreational groundfish fishery would generate $25 million, approximately a 30 percent decline. Alternative 3 would generate $45 million in personal income impacts and Alternative 2, $30 million in impacts.

7.2.10 Other Management Measure Analyses

7.2.10.1 Economic Impacts of Management Measures Designed to Reduce the Mortality of Yelloweye Rockfish

The 2002 yelloweye stock assessment was more optimistic than the 2006 stock assessment. The 2006 stock assessment estimated biomass – or status of the stock – to be at a 17.7% depletion level (percent of unfished biomass), and the 2002 assessment estimated the depletion level to be 24%. This does not mean that the population has been declining, only that the re-estimated stock size is smaller than previously thought. While the difference in the depletion level between the two assessments was a difference of approximately 6.3%, one of the more major changes to the stock assessment pertains to the assumed life history characteristics of yelloweye. The characteristics used in the 2002 rebuilding analysis resulted in estimates that showed the species to be more productive than the 2006 assessment. The result of findings and assumptions used in the 2006 assessment means that the estimates from the 2002 assessment allowed for shorter rebuilding times and/or larger harvests when compared to the 2006 assessment. For example, the 2006 OY for yelloweye was set at 27 metric tons, and the results of the 2002 rebuilding analysis estimated that the stock would be rebuilt by 2023 under the SPR harvest rate that corresponds to a 27 metric ton OY in 2006. Estimates from the 2006 assessment, show that a 2007 OY of 12 metric tons would rebuild the stock in 2078. That is, if the council and NMFS adopted a 66% reduction in the yelloweye OY compared to status quo, the rebuilding period would still be 55 years longer than the previous T_{TARGET}, and 30 years longer than $T_{F=0}$.

This dramatic change in the assessment results will have dramatic implications to management measures designed to protect yelloweye rockfish. Management measures ultimately adopted will likely need to result in a smaller harvest of yelloweye than previous measures, and such management measures will also have negative economic consequences to fishing communities. Under status quo management, the sectors that take the largest amount of yelloweye rockfish are the recreational groundfish and halibut sectors, followed by directed open access groundfish, and limited entry fixed gear and tribal sectors. In order to achieve reductions in the bycatch of overfished groundfish, the council has, in the past, restricted to the greatest extent those sectors that have the largest impact on that particular species. However, in many instances the tribal fisheries are left unaffected. Based on past approaches to management, the largest source of reduction in yelloweye rockfish bycatch is likely to come from the recreational and directed open access sectors. At the end of 2005, the recreational sectors were estimated to take 13.1 metric tons of yelloweye, and all other sectors (including tribal and non-groundfish fisheries) were estimated to take 8.9 metric tons.

Several alternatives were analyzed pertaining to yelloweye rockfish OYs. These OYs include zero harvest, a 2007 OY of 12 mt, 12.6 mt, 17 mt, 21 mt, 24 mt, 27 mt, and a ramp-down strategy which has a 2007 OY of 23 mt, 20 mt in 2008, 17 mt in 2009, and 14 mt in 2010 respectively. Implicit in the ramp down strategy is the development of additional management tools in order to allow some harvest of more abundant target species while reducing the catch of yelloweye over time. It is likely that new management tools would not be able to be developed without a ramp-down strategy because the development of additional tools inherently relies on some additional bycatch in order to test the effectiveness of those tools.

7.2.10.1.1 Economic Impact of a $T_{F=0}$ Yelloweye OY

Under the zero harvest alternative ($T_{F=0}$), the cost to the fishing industry is expected to be substantial. The $T_{F=0}$ harvest alternative is estimated to result in a loss of over $100 million in exvessel revenues and approximately 1,150,000 recreational angler trips. These figures represent a complete closure of multiple sectors including, but not limited to, all bottom-tending commercial fishing gears (outside of selective gears like dive gear) for groundfish species, shrimp species, and other bottom dwelling species like Pacific halibut, California halibut, and sea urchins; the complete closure of Chinook salmon troll fisheries; the complete closure of tribal groundfish fisheries; and the complete closure of recreational fisheries for groundfish, Pacific halibut, and Chinook salmon. This alternative is expected to have substantial negative economic consequences to communities, and these closures would be in place until 2048 – the year yelloweye is estimated to be rebuilt.

7.2.10.1.2 Economic Impact of a 12 metric ton Yelloweye OY in 2007

Under the alternative which puts in place a 12 metric ton yelloweye OY in 2007, multiple sectors and communities are estimated to be negatively impacted to a large degree. Analysis of commercial management measures designed to achieve a suite of OYs for all overfished species which included the 12 mt yelloweye OY showed that exvessel revenues would be reduced by nearly 40%. However, this is likely an overestimate of what would occur if only yelloweye were to be reduced to 12 mt and other overfished species were to remain at status quo levels. In terms of recreational fisheries however, it is estimated that recreational fishing effort for groundfish and Pacific halibut off Washington would decrease by 30% under the 12 metric ton yelloweye alternative. Off Oregon, it is estimated that recreational fishing effort for groundfish and Pacific halibut would decrease by 32%, and recreational fishing effort for groundfish off California would decrease by over 33%. In addition, fishing seasons would be shortened which would have additional implications as fewer tourists would be drawn to communities during times when fishing closures are in place. This means that economic impacts will be larger than indicated by just examining changes in angler trips.

Under the 12 mt 2007 OY alternative, it is believed that commercial fixed gear vessels that homeport along the northern Washington coast and Puget Sound would experience a complete closure of traditional fishing grounds for sablefish. Some of these vessels may choose to move further south along the coast and homeport in different locations in order to access other fishing grounds, however, this would have repercussions to those communities where fixed gear vessels currently homeport, and many of these communities are described as being resource-dependent. This means those communities would be negatively impacted to a larger degree than communities that are not as dependent on resource-based industries. It is estimated that these impacts would be in place until 2078, or 30 years longer than T_{MIN}. It is important to note that state managers of recreational fisheries have stated that multiple recreational fisheries cannot operate if the 2007 OY for yelloweye is less than 12 mt. In order to achieve the necessary reductions in yelloweye mortality, managers would need to completely close multiple sectors of recreational fisheries off Washington, Oregon, and northern California, meaning that for many recreational sectors, the economic impact of T_{MIN} is equivalent to an OY that is several tons higher.

Under a 12.6 metric ton yelloweye OY in 2007 the impacts to commercial fisheries, recreational fisheries, and fishing communities is expected to be nearly equivalent to a 12 metric ton OY.

7.2.10.1.3 Economic Impact of the Ramp-Down Strategy

The yelloweye ramp-down OY results in economic impacts to recreational fisheries that range from near status quo, to reductions in angler effort of approximately 22% in 2007 compared to 2005 levels. Commercial exvessel revenues for alternatives corresponding to the yelloweye ramp-down strategy show that revenues would range from near status quo, to reductions of 13% in 2007 compared to 2005 levels. Beyond 2007, the impacts are less clear as the impact of tools that will be developed will not be fully known until after they have been implemented. However, it is expected that the economic implications will be less than the 12 mt and 12.6 mt 2007 OY alternatives. It is estimated that these impacts would be in place until 2083.5, or 35.5 years longer than $T_{F=0}$.

7.2.10.1.4 Consideration of Other Yelloweye OY Alternatives

Optimum yields that are equivalent to an SPR harvest rate of 17 metric tons or greater in 2007 exceed Tmax according to the 2006 rebuilding analysis, and therefore are not further considered. However, negative economic consequences for these alternatives are far less than SPR harvest rates that correspond to a 12 mt or 12.6 mt OY in 2007.

7.2.10.2 Economic Impacts of Zero Harvest Alternatives for Rebuilding Species

The analysis of zero harvest alternatives examined the economic impacts of setting similar overfished species OYs to zero, where similarity was determined based on the correlation of species across latitude and depths. Species that were considered similar under this definition include canary and yelloweye rockfish; bocaccio and cowcod; and Pacific ocean perch and darkblotched rockfish. Widow rockfish was analyzed independently since it tends to be caught in a more pelagic environment compared to other overfished species.

Sectors were analyzed in this case based on the known associations of those sectors with overfished species under currently in place (2006) management measures. These include existing allocations between sectors and regions, area closures that are currently in place, and current patterns of fishery effort. The analysis shows two columns indicating sectors, where one column is titled “major sector” and another column “sub-sector or area-based stratification”. If a sector is not known to catch a particular overfished species at certain latitudes, then the portion or area of the sector that would need to be closed to keep the particular species catch at a zero harvest is listed specifically. For example, in order to reduce yelloweye and canary rockfish catch to zero, the fixed gear sablefish sector would need to be severely restricted, however west coast groundfish observer data shows this sector encounters those species north of Point Conception, so the affected sector is identified as "fixed gear sablefish north of Point Conception". The notion that an entire sector would need to be closed to protect an overfished species is based in the multi-species nature of the fishery. In many cases it is not possible to catch abundant stocks of target species without incidentally catching overfished species, and therefore, eliminating the catch of overfished species also requires eliminating the catch of target species that co-occur with those overfished species. In this analysis, figures represent the loss in revenue that occurs as a result of zero landings from overfished species as well as zero landings from target species that co-occur with those overfished species.

In this analysis, 2005 revenues are used as an indicator of revenue that would be lost if a sector were to be closed or restricted to reach a zero harvest of a particular overfished species. Table7-69 shows the amount of exvessel revenue that would be lost for each sector within each overfished species grouping, and the total revenue from 2005 for that entire sector is shown for comparison purposes to understand the magnitude of loss.

Based on this analysis, setting the OY of canary and yelloweye to zero would have the largest impact across recreational and commercial fisheries when compared to the other species groupings. The distribution of these impacts would be felt coastwide and across all sectors of the fishery. The second largest impact to commercial and recreational fisheries would be to set the widow OY to zero. This species would impact most sectors across the coast, but some fisheries off the Washington coast, non-groundfish trawl fisheries, and coastal pelagic species south of 40° 10 minutes North latitude would be unaffected. The species grouping with the third largest impact to commercial fisheries on an exvessel revenue basis is darkblotched and POP, whereas the species grouping with the third largest impact to recreational fisheries would be bocaccio and cowcod. Each of these groupings have very different regional and distributional impacts. Darkblotched and POP would impact most commercial sectors that are oriented toward the north, whereas bocaccio and cowcod would impact most commercial and recreational sectors that operate south of 40° 10 minutes North latitude. Finally, if the OY for all overfished species were to be set to zero, all sectors listed in the analysis would be impacted, and the total economic impact would be greater than any of the individual species groupings.

7.2.11 Other Analyses

Vulnerable Commercial Communities

Table 7-70 shows the percentage change in estimated commercial fishery income impacts by port group compared to the No Action Alternative for shoreside landings.

Under Alternative 1, the port groups with the greatest percentage decrease in estimated income from all Council managed commercial fisheries compared to the No Action alternative are Eureka (21.6%), Newport (20.2%) and Fort Bragg (20.0%). All three port groups consist of counties that were identified as three of the six "most vulnerable" counties (Lincoln, Humboldt, and Mendocino counties) in the Engagement, Dependence, Resiliency and Identification of Vulnerable Areas Analysis (Identification of Vulnerable Areas Analysis). These "most vulnerable" areas were identified for the purpose of ranking those counties and ports most reliant upon the commercial and recreational fishery resource but least able to adjust to additional decreases in harvest levels. The analysis identified six commercially "most vulnerable" counties and four "most vulnerable" cities based on commercial fishing data and one recreationally "most vulnerable" city based on recreational data. The analysis also identified several other vulnerable counties and cities that are considered potentially at risk but to a lesser degree than the "most vulnerable" areas.

Morro Bay (13%), Puget Sound (13%) and South and Central Washington Coast (10%) also have large decreases estimated under Alternative 1. The South and Central Washington Coast port group is comprised of three counties, two of which were identified as two of the six most vulnerable counties (Grays Harbor and Pacific counties). The port group also contains one of four cities identified as most vulnerable areas in the Identification of Vulnerable Areas Analysis (Ilwaco). Morro Bay and Puget Sound port groups also encompass some vulnerable areas, but to a lesser degree than the other port groups named above.

The greatest percentage decrease in estimated income from commercial groundfish fisheries compared to the No Action Alternative are Newport (43.5%), Astoria-Tillamook (41%), South and Central Washington Coast (39.9%), Coos Bay (35.9%), Eureka (35.5%), and Fort Bragg (33.3%). As mentioned above, Newport, South and Central Washington Coast, Eureka, and Fort Bragg port groups consist of five of the six counties identified as most vulnerable counties in the Identification of Vulnerable Areas Analysis (Lincoln, Grays Harbor, Pacific, Humboldt, and Mendocino counties). The Coos Bay port group also consists of one of the six counties identified as most vulnerable counties (Coos County). Astoria-Tillamook and Coos Bay encompass counties identified as vulnerable areas to a lesser degree than the ones mentioned above. However, the Astoria-Tillamook contains one of the four ports identified as most vulnerable ports (Garibaldi).

Under Alternative 2, the port groups with the greatest percentage decrease in estimated income from all Council managed commercial fisheries and groundfish fisheries compared to the No Action alternative are Newport (9.7% and 20.8% respectively) and South and Central Washington Coast (6% and 23.6% respectively). As mentioned above, these port groups consist of counties identified as most vulnerable areas.

Under Alternative 3, the port groups with the greatest percentage decrease in estimated income from all Council managed commercial fisheries and groundfish fisheries compared to the No Action alternative are North Washington Coast (4.2%) and Puget Sound (2.6%). Unidentified areas in Washington and North Washington Coast port groups are estimated to experience the largest decreases (14.3% and 9% respectively) in income. North Washington Coast contains one of the four most vulnerable ports (Neah Bay). Neah Bay and La Push are both located in the North Washington Coast port group and both are ranked as least resilient according to the Identification of Vulnerable Areas Analysis. That is, both are ranked in the top one-third of all cities on the West Coast with regard to low resiliency indicators (population levels, percentage of population living below the poverty level, unemployment rate, and industry diversification). Both were identified in a 2004 study by PSMFC as “isolated cities” or cities not located on a major highway and fell outside of a 35-mile buffer of cities over 20,000.

Vulnerable Recreational Communities

Table 7-71 shows the percentage change in estimated recreational income impacts compared to the No Action Alternative.

Under Alternative 1, the regions with the greatest percentage decrease in estimated income from total charter boat trips compared to the No Action alternative are CA South-Central Coast (53.7%), North Central Coast: San Mateo up through Marin County (47.4%), and North-Central Coast: Sonoma and Mendocino counties (47.1%). Brookings (36.1%), North Washington Coast (32.7%), and Newport (30.6%) are also expected to experience relatively large decreases. The South–Central Coast ties with the South Coast: San Diego through LA region as the most highly recreationally engaged area in California according to the Identification of Vulnerable Areas Analysis. The South–Central Coast region encompasses Moss Landing and Santa Cruz, two cities with low resiliency according to the Identification of Vulnerable Areas Analysis and two counties (Monterey and San Luis Obispo) with low resiliency. North-Central Coast: San Mateo up through Marin County contains one city with low resiliency (Oakland). The North-Central Coast: Sonoma and Mendocino region encompasses two cities (Fort Bragg and Bodega Bay) and one county (Mendocino) with low resiliency. The Brookings region contains one recreational vulnerable area (Gold Beach). North Washington Coast contains two recreational vulnerable areas (Neah Bay and La Push) and Newport contains two recreational vulnerable areas (Depoe Bay and Newport). With regard to private boat trips, North Washington Coast (27.3%), Brookings (22.1%), and South Coast: Ventura and Santa Barbara counties (20.4%) are estimated to experience the largest decreases in income. The North Washington Coast contains two recreational vulnerable cities (Neah Bay and La Push), and Brookings contains one recreational vulnerable city (Gold Beach).

The regions predicted to experience the greatest percentage decrease in estimated income under Alternative 1 from recreational groundfish charter boat fisheries compared to the No Action Alternative are the two North Central CA Coast regions (57.6% for San Mateo up through Marin County and 57.1% for Sonoma and Mendocino Counties), South Central Coast (55%) and North Washington Coast (50%). All Oregon regions are estimated to experience decreases above 39% and South CA Coast ports are estimated to experience decreases of about 35%. With regard to private trips, the South Coast regions (57.9% for Ventura and Santa Barbara counties and 57.5% for San Diego through Los Angeles County) are predicted to experience the greatest percentage decrease in income. All Oregon regions are estimated to experience decreases of above 37%.

Under Alternative 2, with regard to total charter boat trips, the regions with the greatest percentage decrease in estimated income compared to the No Action Alternative are South-Central Coast: San Luis Obispo County through Santa Cruz (52.5%), North-Central Coast: San Mateo up through Marin County (44.2%), North-Central Coast: Sonoma and Mendocino counties (43.5%), and North Washington Coast (27.9%). As mentioned previously, the South-Central Coast: San Luis Obispo County through Santa Cruz contains two counties and two cities with low resiliency. North-Central Coast: San Mateo up through Marin County contains one city with low resiliency. North-Central Coast: Sonoma and Mendocino counties contain two cities and one county with low resiliency. The North Washington Coast region contains two recreational vulnerable cities. With regard to total private trips, North Washington Coast (22%) and South Coast: Ventura and Santa Barbara counties (13%) are estimated to experience the largest decreases in income from recreational fishing.

The regions predicted to experience the greatest percentage decrease in estimated income under Alternative 2 from recreational groundfish charter boat fisheries compared to the No Action Alternative are the CA North Central regions (54.3% for Sonoma and Mendocino counties and 53.8% for San Mateo up through Marin County), the CA South Central region (53.7%), and the North Washington Coast (41.7%). With regard to private recreational groundfish trips, the South Coast regions (34.9% for San Diego County through Los Angeles County and 34.2% for Ventura and Santa Barbara counties) and North Washington Coast (31.7%) are estimated to experience the largest decreases in income from recreational fishing.

Under Alternative 3, the regions with the greatest percentage decrease in estimated income from total recreational charter boat trips compared to the No Action Alternative are South-Central Coast (21%) and North Washington Coast (7.7%). With regard to private groundfish trips, South-Central Coast (22.1%) and South Coast: Ventura and Santa Barbara counties (10.2%) are estimated to experience the largest decreases in income from recreational fishing.

The regions predicted to experience the greatest percentage decrease in estimated income under

Alternative 3 from recreational groundfish charter boat trips compared to the No Action Alternative are CA South-Central Coast (21.4%) and North Washington Coast (16.7%). With regard to private trips for groundfish, the South CA Coast (30.2% for San Diego County through LA County, and 28.9% for Ventura and Santa Barbara counties), South Central CA Coast (25.2%), and North Washington coast (24.4%) are estimated to experience the largest decreases in income from recreational fishing.

Cumulative Effects

The Council on Environmental Quality's regulations implementing the procedural provisions of the National Environmental Policy Act defines cumulative effects as

> The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Past actions affecting the socioeconomic environment have included catch restrictions and declining revenue for vessels participating in groundfish fisheries, increasing regulatory complexity, the requirement to carry vessel monitoring systems, the imposition of area closures to protect essential fish habitat, restrictions on fishing gear to protect essential fish habitat, a trawl vessel buyback, growth and change in the demographic and economic nature of coastal communities, and consolidation in the shore-based processing sector amongst others. Reasonably foreseeable future effects include continued restrictions on catch levels to protect overfished species, continued development of tools that reduce the bycatch of overfished species, and continued growth and change in the population of coastal communities. These concepts will be discussed in relation to the alternatives considered and adopted by the council in more detail following the June meeting of the Pacific Fishery Management Council.

Table 7-1. Total Commercial, Tribal, and Recreational Landings and Deliveries by Sector (mt).

Year	At-Sea Catcher-Processors	At Sea Mother-ships	Shoreside Whiting LE Trawl	Shoreside Non-whiting LE Trawl	Shoreside LE Line Gear	Shore-side LE Pot Gear	Shore-side Directed OA	Shore-side Incidental OA	Recreational	Shore-side Tribal	At-Sea Tribal	Total Ground-fish	Non-Tribal, Non-Whiting Shorebased
			Landings and Deliveries										
1995	61,589	40,175	75,472	48,269	3,000	780	3,769	810	2,473	833	0	237,171	61,574
1996	66,170	43,826	83,699	48,745	3,825	541	3,443	1,073	2,893	903	15,313	270,432	63,414
1997	71,175	50,546	87,814	43,508	3,780	440	3,256	835	2,722	846	25,080	290,002	57,263
1998	70,690	50,371	88,852	34,477	2,301	398	2,563	631	4,979	495	24,787	280,544	50,328
1999	68,357	47,870	84,141	33,797	2,581	719	1,499	666	2,854	778	26,550	269,810	44,969
2000	68,341	47,166	86,210	29,337	2,417	708	1,203	504	2,406	788	6,402	245,481	38,981
2001	59,006	35,798	73,572	23,192	1,959	565	1,223	378	2,526	825	6,330	205,372	32,368
2002	36,580	26,624	45,706	20,271	1,793	372	1,099	406	2,270	918	22,286	158,325	28,481
2003	41,315	26,027	51,313	20,628	1,872	611	1,219	281	3,931	5,452	19,674	172,324	32,474
2004	73,582	24,155	89,986	18,925	1,935	634	1,215	150	1,956	8,698	23,767	245,003	26,773
		Share of Total Landings and Deliveries											
1995	26%	17%	32%	20%	1%	0%	2%	0%	1%	0%	0%	100%	
1996	24%	16%	31%	18%	1%	0%	1%	0%	1%	0%	6%	100%	
1997	25%	17%	30%	15%	1%	0%	1%	0%	1%	0%	9%	100%	
1998	25%	18%	32%	12%	1%	0%	1%	0%	2%	0%	9%	100%	
1999	25%	18%	31%	13%	1%	0%	1%	0%	1%	0%	10%	100%	
2000	28%	19%	35%	12%	1%	0%	0%	0%	1%	0%	3%	100%	
2001	29%	17%	36%	11%	1%	0%	1%	0%	1%	0%	3%	100%	
2002	23%	17%	29%	13%	1%	0%	1%	0%	1%	1%	14%	100%	
2003	24%	15%	30%	12%	1%	0%	1%	0%	2%	3%	11%	100%	
2004	30%	10%	37%	8%	1%	0%	0%	0%	1%	4%	10%	100%	
	Share of Non-Whiting, Non-Tribal Landings and Deliveries												
1995	0	0	0	78%	5%	1%	6%	1%	4%	0	0		100%
1996	0	0	0	77%	6%	1%	5%	2%	5%	0	0		100%
1997	0	0	0	76%	7%	1%	6%	1%	5%	0	0		100%
1998	0	0	0	69%	5%	1%	5%	1%	10%	0	0		100%
1999	0	0	0	75%	6%	2%	3%	1%	6%	0	0		100%
2000	0	0	0	75%	6%	2%	3%	1%	6%	0	0		100%
2001	0	0	0	72%	6%	2%	4%	1%	8%	0	0		100%
2002	0	0	0	71%	6%	1%	4%	1%	8%	0	0		100%
2003	0	0	0	64%	6%	2%	4%	1%	12%	0	0		100%
2004	0	0	0	71%	7%	2%	5%	1%	7%	0	0		100%

Adapted from tables associated with the Allocation Committee's February 2006 Meeting.

Table 7-2a. Total domestic shoreside landings and at-sea deliveries (round weight mt) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 1 of 2)

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	3,307	73,557	838	25,972	11,419	59,774	1,729	176,596	102,201	103,039	18,202	174	4	87	160
1982	3,822	67,465	1,027	32,613	18,625	61,470	1,277	61,470	1,277	61,470	12,704	162	8	61	164
1983	4,163	72,100	1,051	29,639	14,685	48,157	889	170,684	97,533	98,584	6,052	58	1	70	322
1984	4,060	78,889	2,721	27,703	14,077	40,020	1,079	168,549	86,939	89,660	4,488	29	0	259	598
1985	3,883	31,692	3,894	30,400	14,308	37,347	967	122,491	86,905	90,799	12,408	26	4	357	536
1986	1,894	81,639	3,463	26,127	13,290	37,012	661	164,086	78,984	82,447	26,330	12	13	130	748
1987	2,586	105,997	4,795	28,796	12,784	40,242	2,644	197,844	87,052	91,847	31,060	21	14	85	307
1988	2,656	135,781	6,867	27,043	10,876	40,980	3,788	227,991	85,343	92,210	32,334	23	41	55	260
1989	3,580	203,578	7,414	29,880	10,439	45,334	2,694	302,919	91,927	99,341	35,550	30	48	61	212
1990	2,932	175,685	8,115	27,701	9,179	43,265	1,813	268,690	84,890	93,005	24,553	19	101	34	153
1991	3,167	200,594	21,040	30,515	9,496	35,282	2,978	303,072	81,438	102,478	19,064	21	103	52	169
1992	1,883	148,186	56,127	24,796	9,360	37,000	3,255	280,607	76,294	132,421	35,710	35	65	27	217
1993	2,200	91,640	42,108	22,107	8,145	38,252	3,483	207,935	74,187	116,295	22,451	51	105	33	252
1994	2,834	162,923	73,611	19,284	7,661	35,361	3,638	305,312	68,778	142,389	14,981	133	66	71	179
1995	1,700	98,376	74,967	19,706	7,951	32,171	2,135	237,006	63,663	138,630	11,342	136	42	187	142
1996	1,790	123,419	85,127	20,807	8,339	30,487	2,559	272,528	63,982	149,109	13,800	178	54	264	150
1997	1,652	142,726	87,410	19,508	7,951	25,576	2,271	287,094	56,958	144,368	17,456	263	79	177	201
1998	506	142,810	88,601	16,722	4,410	22,619	2,180	277,848	46,437	135,038	4,342	257	117	197	223
1999	441	139,940	83,637	20,213	6,660	16,408	1,627	268,926	45,349	128,986	12,404	185	93	632	220
2000	145	120,411	85,843	16,315	6,296	11,702	1,498	242,210	35,956	121,799	14,653	121	81	705	223
2001	156	99,875	73,475	13,863	5,646	7,806	1,427	202,248	28,898	102,373	17,595	92	95	161	331
2002	205	84,494	45,808	13,220	3,830	5,974	2,115	155,646	25,344	71,151	25,302	99	79	215	422
2003	166	86,212	55,336	14,160	5,451	4,136	2,154	167,615	26,067	81,402	13,874	3	73	225	399
2004	114.6	120,735	96,504	13,726	5,848	3,340	2,770	243,037	25,799	122,302	8,969	1.6	100.7	27.48	450.7
2005	139.4	151,002	108,746	14,957	6,344	3,365	1,455	286,008	26,260	135,006	10,860	0.4	122.4	25.46	447.4
1981-1998 Avg	1,999	117,589	44,741	22,631	9,323	30,523	2,123	223,936	61,938	109,046	17,859	85	60	168	299
1991-2005 Avg	1,140	127,556	71,889	18,660	6,893	20,632	2,370	249,139	49,694	121,583	16,187	105	85	200	268
1998-2005 Avg	234	118,185	79,744	15,397	5,561	9,419	1,903	230,442	32,514	112,257	13,500	95	95	273	340

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2a. Total domestic shoreside landings and at-sea deliveries (round weight mt) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 2 of 2)

Year	California Halibut	Salmon	Sea Cucumber	California Sheephead	Gillnet Complex	CPS Squid	CPS Wetfish	HMS	Dungeness Crab	Other Crustaceans	Other Species	Total Non-groundfish	Total
1981	191	7,967	0	0	1,258	23,510	105,357	152,465	9,011	1,480	38,365	358,231	534,827
1982	180	8,831	63	0	1,173	16,360	79,436	115,923	7,623	1,233	46,247	290,168	476,468
1983	289	2,936	74	0	678	1,959	32,076	114,644	7,169	1,403	48,437	216,168	386,852
1984	239	2,180	24	0	829	993	38,084	85,203	6,239	1,849	37,260	178,274	346,822
1985	149	5,043	0	0	1,954	11,071	26,657	34,004	7,703	1,754	43,790	145,456	267,947
1986	197	7,384	35	0	1,801	21,290	28,817	36,916	7,402	1,567	51,113	183,755	347,841
1987	224	9,410	49	0	1,370	19,985	36,860	35,902	8,464	1,447	56,546	201,744	399,588
1988	249	12,518	72	0	1,082	37,232	37,902	36,616	16,715	1,430	59,874	236,403	464,392
1989	273	6,869	0	0	875	40,936	35,160	27,446	16,045	1,806	67,110	232,421	535,341
1990	190	4,682	67	0	775	28,447	39,198	16,088	13,529	2,223	49,672	179,731	448,422
1991	235	3,734	264	0	851	37,388	45,047	11,135	6,185	2,035	31,752	158,035	461,107
1992	272	2,049	0	0	379	13,116	39,219	13,899	15,125	1,607	26,641	148,361	428,968
1993	218	2,214	295	0	309	42,889	31,397	17,300	17,411	1,773	20,341	157,039	364,974
1994	188	1,802	298	118	208	55,489	26,669	20,349	17,682	1,221	17,421	156,875	462,186
1995	262	4,756	268	115	276	70,363	52,963	18,538	16,937	1,462	17,857	195,646	432,652
1996	306	3,306	381	115	347	80,715	49,154	29,396	24,564	1,498	18,931	223,159	495,685
1997	415	3,700	209	141	340	70,471	70,617	26,406	12,347	2,010	22,731	227,563	514,655
1998	415	1,850	349	119	255	2,931	68,576	29,640	11,748	1,720	10,671	133,410	411,294
1999	385	2,709	272	63	394	92,122	76,092	17,702	15,783	1,478	11,901	232,435	501,575
2000	218	3,707	291	79	333	117,984	103,360	14,534	13,015	1,619	13,496	284,419	526,692
2001	245	3,358	323	68	264	85,959	106,105	14,816	11,234	1,643	12,530	254,819	457,100
2002	309	4,660	426	52	353	72,958	106,754	12,908	15,505	1,465	16,639	258,146	413,791
2003	293	5,986	344	48	141	39,348	77,843	20,004	32,556	1,287	24,577	217,001	384,616
2004	457.7	5,662	261	39.6	174	40,068	103,288	15,117	27,542	631	17,218	210,457	453,494
2005	418.3	4,298	265	40.2	192	55,608	101,922	10,080	24,120	368	18,727	216,039	439,975
1981-2005 Avg	*272.72*	*4,864*	*185.2*	*39.912*	*664.44*	*43,168*	*60,742*	*37,081*	*14,466*	*1,520*	*31,194*	*211,830*	*438,291*
1991-2005 Avg	*309*	*3,586*	*283*	*67*	*321*	*58,494*	*70,600*	*18,122*	*17,450*	*1,454*	*18,762*	*204,894*	*449,918*
1998-2005 Avg	*343*	*4,029*	*316*	*64*	*263*	*63,372*	*92,993*	*16,850*	*18,938*	*1,276*	*15,720*	*225,841*	*448,567*

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2b. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of current dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 1 of 2)

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	1,662	12,264	141	14,834	5,258	22,339	757	57,254	44,850	44,991	20,160	780	38	165	411
1982	2,088	11,863	182	19,727	10,282	26,479	695	71,315	59,271	59,452	14,278	811	87	157	433
1983	2,284	12,783	186	17,735	7,691	23,775	529	64,983	52,014	52,200	9,753	370	13	141	805
1984	2,184	11,739	406	16,361	6,684	22,111	637	60,122	47,977	48,383	4,526	217	1	327	1,105
1985	2,241	4,631	571	18,633	10,564	23,223	576	60,440	55,238	55,809	9,648	245	47	483	1,226
1986	1,321	10,605	452	17,425	10,985	25,675	479	66,943	55,886	56,338	30,975	118	117	234	2,489
1987	2,151	14,662	664	22,235	13,423	31,069	1,949	86,153	70,827	71,491	46,534	203	176	209	1,250
1988	2,137	22,440	1,136	20,796	12,499	29,323	2,241	90,572	66,996	68,132	29,129	240	444	154	1,106
1989	2,768	29,256	1,071	20,521	10,796	32,137	1,570	98,119	67,792	68,863	28,615	215	503	176	863
1990	2,290	22,583	1,049	17,253	9,661	32,496	983	86,315	62,683	63,732	26,577	159	1,101	101	905
1991	2,457	23,437	2,396	21,246	14,330	28,922	1,669	94,457	68,624	71,020	23,407	222	1,189	148	1,077
1992	1,617	17,968	5,885	16,452	13,633	31,616	1,838	89,009	65,156	71,041	27,293	433	878	131	1,037
1993	1,846	7,071	2,843	14,669	10,009	32,530	1,774	70,742	60,827	63,670	16,472	610	1,545	140	972
1994	2,421	12,931	4,904	13,069	13,970	35,811	2,023	85,130	67,294	72,198	19,326	1,713	1,000	212	908
1995	1,683	10,194	7,821	15,367	23,640	39,581	1,721	100,007	81,992	89,814	18,088	1,898	670	476	676
1996	1,821	13,604	5,107	15,597	25,897	33,805	1,940	97,770	79,060	84,167	18,171	2,578	844	777	764
1997	1,740	19,195	8,162	14,323	27,878	27,883	2,044	101,224	73,867	82,029	15,224	3,721	1,235	690	891
1998	718	13,538	4,845	12,514	11,380	24,997	2,946	70,938	52,554	57,400	5,052	3,697	1,859	762	794
1999	715	11,723	6,871	13,679	17,103	20,497	2,547	73,134	54,541	61,411	12,822	2,682	1,577	1,545	962
2000	345	10,885	7,969	13,980	20,325	17,398	2,639	73,540	54,686	62,656	12,951	2,182	1,635	1,793	1,209
2001	387	10,569	5,748	12,631	17,512	12,880	1,957	61,684	45,367	51,115	10,293	1,703	1,905	532	1,474
2002	506	9,119	4,540	11,828	11,810	11,066	2,615	51,485	37,825	42,365	15,358	1,755	1,592	633	1,818
2003	412	10,454	5,525	13,141	18,442	7,675	2,632	58,281	42,302	47,827	7,668	61	1,504	676	2,303
2004	432	9,663	7,724	12,792	16,973	6,832	3,108	57,092	39,705	47,429	7,623	2	101	27	2,636
2005	461	17,438	12,558	13,961	20,233	6,490	2,420	73,100	43,103	55,662	10,410	0	122	25	2,485
1981-2005 Avg	1,547	14,025	3,950	16,031	14,439	24,264	1,772	75,992	58,017	61,968	17,614	1,065	807	429	1,224
1991-2005 Avg	1,171	13,186	6,193	14,350	17,542	22,532	2,258	77,173	57,794	63,987	14,677	1,550	1,177	571	1,334
1998-2005 Avg	497	11,674	6,973	13,066	16,722	13,479	2,608	64,907	46,260	53,233	10,272	1,510	1,287	749	1,710

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2b. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of current dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2003 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 2 of 2)

Year	California Halibut	Salmon	Sea Cucumber	California Sheephead	Gillnet Complex	CPS Squid	CPS Wetfish	HMS	Dungeness Crab	Other Crustaceans	Other Species	Total Non-groundfish	Total
1981	567	31,772	0	0	2,082	5,080	14,183	199,799	18,259	3,401	28,852	325,547	382,801
1982	551	37,410	25	0	1,897	3,581	9,636	134,490	18,155	3,944	27,199	252,654	323,970
1983	929	9,090	26	0	1,161	838	5,460	117,933	23,427	3,827	28,978	202,751	267,735
1984	897	10,748	10	0	1,397	500	6,852	95,099	21,798	6,705	17,509	167,690	227,811
1985	592	20,869	0	0	2,669	4,065	4,880	42,061	24,628	4,180	22,910	138,503	198,943
1986	865	25,187	16	0	2,483	4,527	4,857	44,987	22,709	5,309	23,395	168,268	235,213
1987	1,067	46,073	23	0	2,282	3,960	5,508	49,233	25,735	5,178	29,109	216,541	302,694
1988	1,246	68,050	32	0	1,936	7,868	6,461	59,069	43,507	5,758	34,883	259,885	350,457
1989	1,340	26,754	0	0	1,919	6,962	6,020	39,944	39,896	6,308	40,777	200,290	298,409
1990	985	21,966	36	0	1,649	4,748	5,420	24,676	45,598	7,187	47,905	189,014	275,329
1991	1,247	14,203	187	0	1,766	6,086	7,063	17,225	21,446	6,860	51,898	154,024	248,481
1992	1,443	9,271	0	0	939	2,497	6,270	26,177	38,884	6,710	47,608	169,570	258,580
1993	1,146	8,931	353	0	904	10,194	3,824	31,130	42,735	5,966	38,135	163,057	233,797
1994	1,117	7,260	424	750	541	14,369	3,882	37,482	52,617	5,742	35,903	183,243	268,371
1995	1,566	15,443	416	701	797	22,342	5,368	27,140	63,482	7,567	38,784	205,413	305,419
1996	1,738	9,337	544	694	982	21,908	5,452	45,587	74,352	8,091	39,254	231,072	328,845
1997	2,180	10,105	232	860	1,315	20,707	8,259	40,516	51,854	10,528	34,802	203,120	304,343
1998	2,107	5,712	456	693	892	1,631	6,860	40,274	46,281	8,658	11,416	137,143	208,080
1999	2,080	9,688	418	452	1,482	33,405	7,408	33,021	67,236	6,167	17,862	198,807	271,944
2000	1,349	13,943	605	593	1,280	27,076	11,935	32,941	61,658	8,197	20,248	199,595	273,136
2001	1,545	10,578	581	515	1,095	16,866	12,322	31,505	51,301	8,515	17,890	168,620	230,303
2002	1,988	13,015	792	391	1,504	18,261	11,944	22,032	57,848	8,257	15,082	172,270	223,755
2003	1,920	20,906	689	381	660	23,068	8,404	33,592	113,039	7,917	37,383	260,171	318,452
2004	3,119	30,676	541	329	635	19,779	12,874	29,439	100,327	1,726	29,454	228,899	285,991
2005	2,844	24,092	665	361	815	31,556	12,090	23,148	81,147	1,019	30,560	208,297	281,397
1981-2005 Avg	1,457	20,043	283	269	1,403	12,475	7,729	51,140	48,317	6,149	30,712	200,178	276,170
1991-2005 Avg	1,826	13,544	460	448	1,040	17,983	8,264	31,414	61,614	6,795	31,085	192,220	269,393
1998-2005 Avg	2,119	16,076	593	464	1,045	21,455	10,480	30,744	72,355	6,307	22,487	196,725	261,632

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2c. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of inflation adjusted 2005 dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2005 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 1 of 2)

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	2,651	19,564	225	23,663	8,388	35,635	1,208	91,332	71,545	71,770	32,159	1,244	61	263	656
1982	3,353	19,048	292	31,674	16,509	42,516	1,116	114,506	95,167	95,458	22,925	1,302	140	252	695
1983	3,613	20,219	294	28,052	12,165	37,606	837	102,787	82,273	82,567	15,427	585	21	223	1,273
1984	3,368	18,102	626	25,229	10,307	34,096	982	92,710	73,982	74,608	6,979	335	2	504	1,704
1985	3,401	7,028	867	28,277	16,032	35,243	874	91,723	83,828	84,695	14,642	372	71	733	1,861
1986	1,976	15,867	676	26,071	16,436	38,415	717	100,160	83,617	84,293	46,345	177	175	350	3,724
1987	3,172	21,621	979	32,789	19,794	45,816	2,874	127,046	104,445	105,425	68,622	299	260	308	1,843
1988	3,093	32,480	1,644	30,100	18,091	42,442	3,244	131,094	96,970	98,614	42,161	347	643	223	1,601
1989	3,939	41,634	1,524	29,203	15,364	45,734	2,234	139,631	96,474	97,998	40,722	306	716	250	1,228
1990	3,228	31,836	1,479	24,322	13,619	45,811	1,386	121,681	88,366	89,845	37,466	224	1,552	142	1,276
1991	3,467	33,068	3,381	29,977	20,219	40,808	2,355	133,274	96,825	100,206	33,026	313	1,678	209	1,520
1992	2,243	24,920	8,162	22,817	18,908	43,848	2,549	123,447	90,365	98,527	37,853	601	1,218	182	1,438
1993	2,523	9,666	3,886	20,051	13,682	44,466	2,425	96,699	83,146	87,032	22,516	834	2,112	191	1,329
1994	3,235	17,277	6,552	17,461	18,665	47,846	2,703	113,741	89,910	96,462	25,821	2,289	1,336	283	1,213
1995	2,215	13,416	10,293	20,224	31,112	52,092	2,265	131,619	107,909	118,204	23,806	2,498	882	626	890
1996	2,341	17,492	6,567	20,055	33,299	43,467	2,494	125,715	101,657	108,224	23,365	3,315	1,085	999	982
1997	2,171	23,949	10,183	17,870	34,782	34,789	2,550	126,293	92,161	102,344	18,994	4,643	1,541	861	1,112
1998	869	16,390	5,866	15,150	13,777	30,262	3,567	85,881	63,624	69,491	6,116	4,476	2,251	923	961
1999	836	13,711	8,036	15,998	20,003	23,972	2,979	85,534	63,789	71,823	14,996	3,137	1,844	1,807	1,125
2000	391	12,346	9,039	15,857	23,053	19,733	2,993	83,412	62,027	71,067	14,689	2,475	1,854	2,034	1,371
2001	436	11,908	6,476	14,232	19,731	14,512	2,205	69,501	51,116	57,593	11,597	1,919	2,146	599	1,661
2002	562	10,128	5,042	13,136	13,116	12,290	2,904	57,180	42,009	47,052	17,057	1,949	1,768	703	2,019
2003	446	11,321	5,983	14,231	19,972	8,312	2,850	63,115	45,810	51,794	8,304	66	1,629	732	2,494
2004	449	10,037	8,022	13,286	17,628	7,096	3,228	59,297	41,238	49,261	7,917	2	105	28	2,738
2005	461	17,438	12,558	13,961	20,233	6,490	2,420	73,100	43,103	55,662	10,410	0	122	25	2,485
1981-2005 Avg	2,178	18,819	4,746	21,748	18,595	33,332	2,238	101,619	78,054	82,801	24,157	1,348	1,008	538	1,568
1991-2005 Avg	1,510	16,204	7,336	17,621	21,212	28,666	2,699	95,187	71,646	78,983	18,431	1,901	1,438	680	1,556
1998-2005 Avg	556	12,910	7,628	14,481	18,439	15,334	2,893	72,127	51,590	59,218	11,386	1,753	1,465	856	1,857

NOTE: Inflation adjustment used is the U.S. GDP Deflator (http://www.bea.gov/bea/dn/home/gdp.htm). For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2c. Total domestic shoreside landings and at-sea deliveries (exvessel revenue, thousands of inflation adjusted 2005 dollars) from West Coast (WA, OR, CA) ocean area fisheries (0-200 miles) coastwide, 1981-2005 (includes commercial tribal fisheries, based on PacFIN data and Council [1997]). (Page 2 of 2)

Year	California Halibut	Salmon	Sea Cucumber	California Sheephead	Gillnet Complex	CPS Squid	CPS Wetfish	HMS	Dungeness Crab	Other Crustaceans	Other Species	Total Non-groundfish	Total
1981	904	50,683	0	0	3,321	8,104	22,625	318,720	29,127	5,425	46,025	519,313	610,645
1982	885	60,067	40	0	3,046	5,750	15,472	215,942	29,150	6,333	43,672	405,670	520,177
1983	1,469	14,378	41	0	1,836	1,326	8,636	186,540	37,056	6,053	45,836	320,701	423,489
1984	1,383	16,574	15	0	2,154	771	10,566	146,646	33,613	10,339	27,000	258,585	351,294
1985	898	31,670	0	0	4,050	6,169	7,406	63,831	37,375	6,343	34,768	210,190	301,912
1986	1,294	37,685	24	0	3,715	6,773	7,267	67,310	33,977	7,943	35,004	251,763	351,926
1987	1,573	67,942	34	0	3,365	5,840	8,122	72,602	37,950	7,636	42,926	319,324	446,370
1988	1,803	98,495	46	0	2,802	11,388	9,352	85,496	62,972	8,334	50,490	376,157	507,251
1989	1,907	38,073	0	0	2,731	9,907	8,567	56,844	56,775	8,977	58,029	285,029	424,661
1990	1,389	30,966	51	0	2,325	6,693	7,641	34,786	64,281	10,132	67,533	266,458	388,139
1991	1,759	20,040	264	0	2,492	8,587	9,966	24,304	30,259	9,679	73,226	217,320	350,594
1992	2,001	12,858	0	0	1,302	3,463	8,696	36,305	53,928	9,306	66,028	235,177	358,625
1993	1,566	12,208	483	0	1,236	13,934	5,227	42,552	58,416	8,155	52,128	222,887	319,583
1994	1,492	9,700	566	1,002	723	19,198	5,187	50,079	70,301	7,672	47,969	244,827	358,565
1995	2,061	20,324	547	923	1,049	29,404	7,065	35,719	83,548	9,959	51,043	270,343	401,960
1996	2,235	12,006	699	892	1,263	28,170	7,010	58,617	95,603	10,404	50,474	297,117	422,836
1997	2,720	12,608	289	1,073	1,641	25,835	10,304	50,550	64,696	13,135	43,421	253,425	379,717
1998	2,551	6,915	552	839	1,080	1,975	8,305	48,758	56,030	10,482	13,821	166,031	251,911
1999	2,433	11,331	489	529	1,733	39,069	8,664	38,620	78,636	7,213	20,891	232,515	318,053
2000	1,530	15,815	686	673	1,452	30,711	13,537	37,363	69,935	9,297	22,966	226,388	309,801
2001	1,741	11,919	655	580	1,234	19,003	13,884	35,498	57,802	9,594	20,157	189,989	259,489
2002	2,208	14,455	880	434	1,670	20,281	13,265	24,469	64,247	9,170	16,750	191,327	248,508
2003	2,079	22,640	746	413	715	24,981	9,101	36,378	122,414	8,574	40,483	281,749	344,864
2004	3,239	31,861	562	342	660	20,543	13,371	30,576	104,201	1,793	30,591	237,738	297,035
2005	2,844	24,092	665	361	815	31,556	12,090	23,148	81,147	1,019	30,560	208,297	281,397
1981-2005 Avg	1,839	27,412	333	322	1,936	15,177	10,053	72,866	60,538	8,119	41,272	267,533	369,152
1991-2005 Avg	2,164	15,918	539	537	1,271	21,114	9,711	38,196	72,744	8,363	38,701	231,675	326,863
1998-2005 Avg	2,328	17,378	654	521	1,170	23,515	11,527	34,351	79,302	7,143	24,527	216,754	288,882

NOTE: Inflation adjustment used is the U.S. GDP Deflator (http://www.bea.gov/bea/dn/home/gdp.htm). For 1981- 1990, at- sea whiting catch estimates are from Council 1997.

Table 7-3. Overfished Species Ranking by Sector and Area.

		OVERFISHED SPECIES						
AREA	SECTOR	BCCCIO	CANARY	COWCD	D'BLTCH	POP	WIDOW	Y'EYE
N 40 10	LE FG-DOGFISH		ML					MH
	LE FG-NEARSHORE		ML					MH
	LE FG-SABLEFISH		ML					MH
	LE B-TRAWL-DEEP		ML		HIGH	HIGH		
	LE B-TRAWL-SHELF		HIGH					
	LE MW-TRAWL-WHITING		HIGH		ML	ML	HIGH	
	OA FG-DOGFISH		ML					MH
	OA FG-NEARSHORE		MH					MH
	OA FG-SABLEFISH		ML					MH
	WA REC P.HALIBUT		ML					HIGH
	WA REC BOTTOMFISH		ML					HIGH
	OR REC P. HALIBUT		MH					HIGH
	OR REC BOTTOMFISH		MH					HIGH
	CA REC BOTTOMFISH		ML					ML
38 - 40 10	LE FG-NEARSHORE	ML	ML					
	LE FG-SABLEFISH	ML	ML					
	LE B-TRAWL-DEEP	ML	ML		MH			
	LE B-TRAWL-SHELF	HIGH	MH					
	OA FG-NEARSHORE	ML	ML					
	OA FG-SABLEFISH	ML	ML					
	CA REC. BOTTOMFISH	ML	MH					ML
36 - 38	LE FG-NEARSHORE	ML	ML	ML				
	LE FG-SABLEFISH	ML	ML	ML				
	LE B-TRAWL-DEEP	ML	ML					
	LE B-TRAWL-SHELF	HIGH	ML	MH				
	OA FG-NEARSHORE	ML	ML	ML				
	OA FG-SABLEFISH	ML	ML	ML				
	CA REC. BOTTOMFISH	ML	MH					ML
S 36	LE FG-NEARSHORE	ML		ML				
	LE FG-SABLEFISH	ML		ML				
	LE B-TRAWL-DEEP	ML						
	LE B-TRAWL-SHELF	HIGH		MH				
	OA FG-NEARSHORE	ML		ML				
	OA FG-SABLEFISH	ML		ML				
	CA REC BOTTOMFISH	HIGH		ML				

Table 7-4a. Port Engagement in Groundfish Sectors in Areas North of 40°10' N Latitude.

		SECTOR								
AREA	PORT	LE B-TRAWL-DEEP	LE B-TRAWL-SHELF	LE FG-DOGFISH	LE FG-NEARSHORE	LE FG-SABLEFISH	LE MW-TRAWL-WHITING	OA FG-DOGFISH	OA FG-NEARSHORE	OA FG-SABLEFISH
N 40 10	ABERDEEN									√
	ASTORIA	√	√		√	√	√			√
	BANDON									√
	BELLINGHAM BAY	√	√	√		√		√		√
	BLAINE	√	√	√		√				
	BROOKINGS	√	√			√			√	√
	CATHLAMET					√				
	CHARLESTON (COOS BAY)	√	√			√	√		√	√
	CHINOOK					√				√
	CRESCENT CITY	√	√		√	√	√		√	√
	DEPOE BAY								√	
	EUREKA	√	√			√	√		√	√
	EVERETT					√				
	FIELDS LANDING									√
	FLORENCE									√
	GARIBALDI (TILLAMOOK)					√			√	√
	GOLD BEACH								√	
	ILWACO					√	√			√
	LAPUSH					√				√
	MILL CREEK								√	
	NEAH BAY	√	√			√				√
	NEWPORT	√	√			√	√		√	√
	PACIFIC CITY								√	
	PORT ANGELES					√				√
	PORT ORFORD				√	√			√	√
	PORT TOWNSEND									√
	SEATTLE						√			√
	TOKELAND									√
	TRINIDAD								√	
	WESTPORT	√	√			√	√			√
	WINCHESTER BAY					√				√

Table 7-4b. Port Engagement in Groundfish Fisheries in Areas South of 40°10' N Latitude.

		SECTOR								
AREA	PORT	LE B-TRAWL-DEEP	LE B-TRAWL-SHELF	LE FG-DOGFISH	LE FG-NEARSHORE	LE FG-SABLEFISH	LE MW-TRAWL-WHITING	OA FG-DOGFISH	OA FG-NEARSHORE	OA FG-SABLEFISH
38 - 40 10	ALBION								√	
	BODEGA BAY					√			√	
	FORT BRAGG	√	√			√			√	√
	POINT ARENA								√	
	POINT REYES									√
	SHELTER COVE								√	
36 - 38	BIG CREEK								√	
	BODEGA BAY									√
	ELK									√
	MONTEREY	√	√			√			√	√
	MOSS LANDING	√	√			√			√	√
	PRINCETON / HALF MOON BAY	√	√			√			√	√
	SAN FRANCISCO	√	√		√	√			√	√
	SANTA CRUZ								√	
	SANTA CRUZ									√
S 36	AVILA					√			√	
	BERKELEY								√	
	DANA POINT					√				
	LONG BEACH					√				
	MISSION BAY					√				√
	MORRO BAY	√	√			√			√	√
	NEWPORT BEACH					√				
	OCEANSIDE					√				√
	OXNARD				√	√			√	√
	PLAYA DEL REY					√				
	POINT LOMA									√
	SAN DIEGO								√	√
	SAN PEDRO								√	
	SAN SIMEON								√	
	SANTA BARBARA				√				√	
	TERMINAL ISLAND					√				√
	VENTURA								√	√
	WILMINGTON				√					

Table 7-5. Count of Vessels Making Landings by Species Group.

Species Group	2000	2001	2002	2003	2004	2005
Coastal Pelagic	487	381	355	314	313	261
Crab	1,387	1,239	1,311	1,288	1152	1,084
Groundfish	1,993	1,800	1,619	1,511	1332	1,292
Highly Migratory	958	1,116	875	1,034	919	721
Other	1,624	1,642	1,558	1,404	1328	1,234
Salmon	1,255	1,265	1,271	1,203	1427	1,339
Shellfish	110	95	228	81	123	89
Shrimp	328	301	296	215	187	170
Total Unique Vessels	4,276	4,010	4,020	3,811	3,622	3,369

Source: PacFIN FT and FTL tables. July 2005

Table 7-6. Shoreside Landings and Exvessel Revenue by Species Category and Year.

		Year				
Species Group	Data type	2001	2002	2003	2004	2005
Coastal Pelagic Species	Landed weight (lbs)	431,365,373	403,146,822	276,183,979	316,067,022	347,255,384
	Exvessel Revenue ($)	32,466,769	32,734,497	35,180,414	32,653,726	43,651,323
Crab	Landed weight (lbs)	26,646,332	37166,847	76,025,265	63,368,168	54,848,429
	Exvessel Revenue ($)	54,022,945	62,591,244	119,970,195	104,609,854	83,451,056
Groundfish	Landed weight (lbs)	226,350,318	164,017,318	180,989,727	267,801,292	296,121,120
	Exvessel Revenue ($)	52,005,278	43,443,802	49,057,826	47,832,317	56,208,733
Highly Migratory Species	Landed weight (lbs)	27,377,162	23,269,259	38,156,859	32,908,310	21,830,731
	Exvessel Revenue ($)	24,268,210	17,256,706	28,248,409	29,446,061	23,158,656
Other	Landed weight (lbs)	19,729,492	21,157,102	17,278,995	18,076,461	17,848,978
	Exvessel Revenue ($)	24,072,979	23,576,471	20,980,130	21,913,540	21,054,424
Salmon	Landed weight (lbs)	6,458,731	9,795,556	11,522,470	10,857,893	8,244,773
	Exvessel Revenue ($)	10,606,112	14,358,711	21,011,634	30,902,881	24,159,157
Shellfish	Landed weight (lbs)	18,552,635	27,117,624	28,540,501	30,588,533	31,709,371
	Exvessel Revenue ($)	44,101,283	61,294,746	65,420,466	87,913,770	79,461,336
Shrimp	Landed weight (lbs)	40,995,148	57,850,787	32,162,900	21,351,766	25,120,667
	Exvessel Revenue ($)	16,803,835	21,475,074	11,490,842	11,041,571	14,066,750
Total Landed weight (lbs)		797,475,191	743,521,315	660,860,696	761,019,445	802,979,453
Total Exvessel Revenue ($)		258,347,409	276,731,251	351,359,914	366,313,719	345,211,435

Source: PacFIN ftl table. August 2004

Note: Data shown is for PFMC management areas and does not include inside waters such as Puget Sound and Columbia River.

Table 7-7. Shoreside Landings and Revenue by Gear Type and Year.

		Year				
Gear	Data type	2001	2002	2003	2004	2005
Dredge	Landed weight (lbs)		C		C	C
	Exvessel Revenue ($)		C		C	C
Hook and Line	Landed weight (lbs)	11,020,519	12,703,981	10,772,455	10,024,355	9,156,856
	Exvessel Revenue ($)	19,231,233	17,839,558	19,844,158	19,008,966	19,500,558
Misc	Landed weight (lbs)	33,692,759	43,168,744	40,711,529	43,901,647	43,979,921
	Exvessel Revenue ($)	58,190,196	74,343,110	75,474,308	96,787,328	87,069,866
Net	Landed weight (lbs)	434,945,382	406,344,617	278,973,327	318,813,541	350,683,566
	Exvessel Revenue ($)	36,694,139	36,381,139	38,413,902	35,732,115	47,041,661
Pot	Landed weight (lbs)	29,262,535	39,985,745	79,646,584	66,968,591	59,661,693
	Exvessel Revenue ($)	64,283,421	72,130,216	131,455,587	116,678,161	97,299,820
Troll	Landed weight (lbs)	28,793,540	26,968,998	45,807,868	40,980,942	27,592,753
	Exvessel Revenue ($)	29,259,325	25,526,431	43,894,614	56,817,652	44,424,182
Trawl	Landed weight (lbs)	219,949,824	157,484,545	173,477,263	260,183,431	287,705,054
	Exvessel Revenue ($)	36,469,749	31,435,464	33,200,917	32,713,800	38,766,282
Shrimp Trawl	Landed weight (lbs)	39,810,632	56,863,283	31,471,670	20,146,932	24,197,316
	Exvessel Revenue ($)	14,219,346	19,073,996	9,076,428	8,575,689	11,107,146
Total Landed weight (lbs)		797,475,191	743,519,913*	660,860,696	761,019,439*	802,977,159*
Total Exvessel Revenue ($)		258,347,409	276,729,913*	351,359,914	366,313,709*	345,209,515*

Source: PacFIN ftl table. August 2004

Note: Data shown is for PFMC management areas only and does not include areas such as Puget Sound and Columbia River for example.

C means data was restricted due to confidentiality

* totals do not include confidential data

Table 7-8. Shoreside Groundfish Landings and Revenue by Trawl and Non-Trawl Vessels.

Gear Group	Data	2000	2001	2002	2003	2004	2005
Non-Trawl	Landed Weight (mt)	4,163	3,561	3,051	3,347	3,456	3,949
	Landed Revenue (1000's $)	16,997	14,326	12,039	14,626	14,086	16,909
Trawl	Landed Weight (mt)	117,152	98,388	70,513	73,296	109,482	116,677
	Landed Revenue (1000's $)	42,402	34,294	28,962	30,204	29,345	33,946
Trawl Portion	Landed Weight (mt)	0.97	0.97	0.96	0.96	0.97	0.97
	Landed Revenue (1000's $)	0.71	0.71	0.71	0.67	0.68	0.67

Source: PacFIN ftl data. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-9. Count of Limited Entry Trawl Vessels Making Landings by State, Year, and Vessel Length.

		Vessel Length (feet)						
State	YEAR	0–40	41 - 50	51 - 60	61 - 70	71 - 80	81 - 90	> 90
CA	2000	1	13	24	20	18	6	2
	2001	4	10	16	15	12	7	1
	2002	2	5	5	8	12	3	0
	2003	3	8	8	4	5	1	0
OR	2000	1	3	21	35	30	15	7
	2001	2	7	19	34	31	13	3
	2002	2	5	17	32	29	14	3
	2003	2	5	17	33	28	15	3
WA	2000	0	3	5	5	10	4	3
	2001	0	5	5	4	12	3	1
	2002	0	2	6	3	8	4	1
	2003	0	1	2	4	9	3	1

Source: PacFIN ftl and cg tables. July 2004

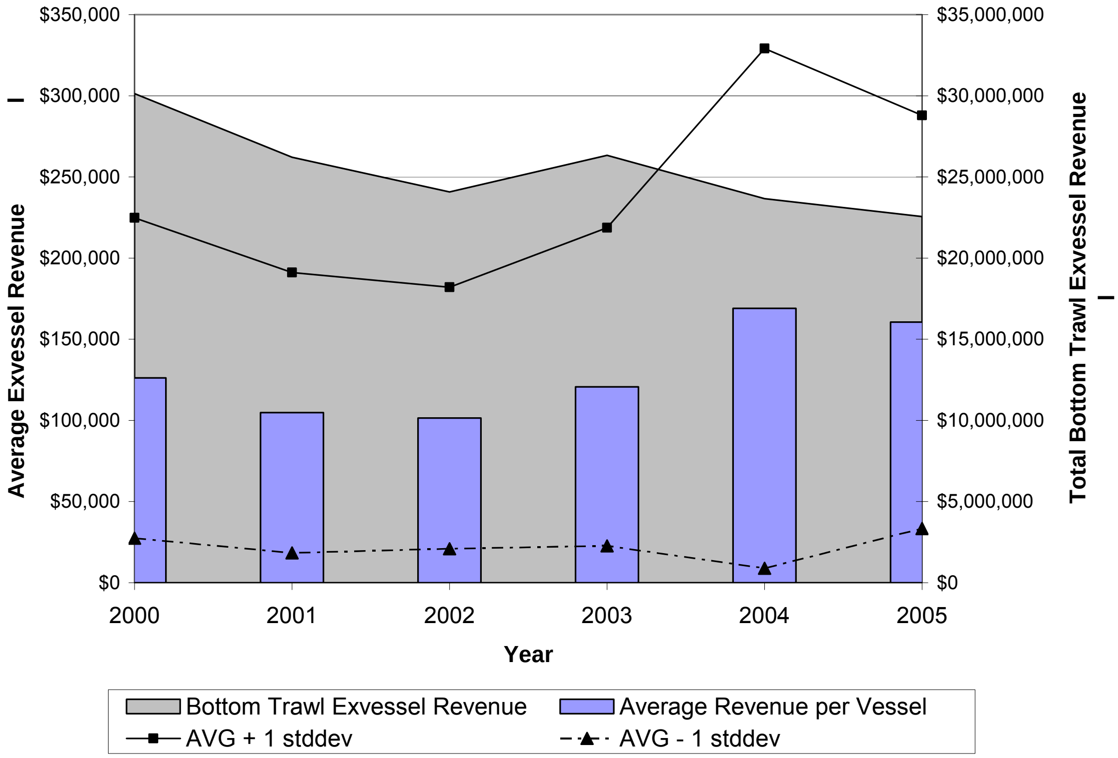


Figure 7-1. Annual Bottom Trawl Vessel Revenues per Year Where the Catch is Non-Hake Groundfish.

Table7-10. Count of Trawl Vessels Landing Non-Hake Groundfish by Port and Year.

PORT	2000	2001	2002	2003	2004
ASTORIA	54	48	41	44	32
AVILA	13	15	16	13	7
BELLINGHAM BAY	7	16	6	9	6
BROOKINGS	11	11	11	13	8
CHARLESTON (COOS BAY)	30	30	25	28	21
CRESCENT CITY	26	21	24	19	4
EUREKA	27	32	30	28	15
FIELDS LANDING	15	14			
FORT BRAGG	17	19	29	14	11
MONTEREY	5	4	5	5	3
MORRO BAY	17	10	11	10	10
MOSS LANDING	16	15	14	16	16
NEAH BAY	11	11	5	8	5
NEWPORT	41	41	31	33	27
PORT ANGELES	7	8	10		5
PRINCETON / HALF MOON BAY	14	14	12	11	12
SAN FRANCISCO	26	18	17	12	10
SANTA BARBARA	5	14	14	8	4
SANTA CRUZ	6	5	6	6	4
VENTURA	5	7	10	8	3
WESTPORT	19	11	10	9	9

Note: ports with fewer than three trawl vessels in any year were excluded for confidentiality purposes
Source: PacFIN ft and ftl tables.

Table 7-11. Non-Tribal Trawl Shoreside Landings and Exvessel Revenue by State and Year.

State	Species Aggregation	Data Type	2000	2001	2002	2003	2004	2005
CA	Non-whiting	Landed weight (mt)	9,764	7,929	8,026	7,330	6,101	5,760
		Exvessel Rev (1000's $)	11,859	9,546	10,068	8,618	7,090	7,021
	Pacific Whiting	Landed weight (mt)	4,986	2,306	2,773	1,695	4,742	3,062
		Exvessel Rev (1000's $)	765	171	274	166	641	338
OR	Non-whiting	Landed weight (mt)	15,952	12,152	8,410	10,499	10,245	10,786
		Exvessel Rev (1000's $)	17,974	14,687	10,150	12,897	11,833	12,441
	Pacific Whiting	Landed weight (mt)	68,702	53,376	32,305	36,581	59,075	61,463
		Exvessel Rev (1000's $)	6,081	4,132	3,219	3,642	4,641	7,107
WA	Non-whiting	Landed weight (mt)	5,593	4,896	8,370	4,258	3,481	3,315
		Exvessel Rev (1000's $)	4,601	4,319	4,189	3,598	3,148	3,191
	Pacific Whiting	Landed weight (mt)	12,156	17,730	10,630	12,934	25,838	32,291
		Exvessel Rev (1000's $)	1,122	1,439	1,061	1,283	1,993	3,848

Source: PacFIN ftl data. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table7-12 . Shoreside Non-Tribal Trawl Groundfish Landings and Exvessel Revenue by Year, State, and Trawl Type.

Trawl Type	State	Data	Year 2000	2001	2002	2003	2004	2005
Bottom Trawl	CA	Landed wt (mt)	8,910	7,442	7,928	7,320	6,062	5,727
		Exvessel Rev (1000's $)	10,954	9,034	9,960	8,611	7,054	6,993
	OR	Landed wt (mt)	11,341	10,012	7,942	10,459	10,081	10,613
		Exvessel Rev (1000's $)	13,503	12,545	9,661	12,811	11,585	12,250
	WA	Landed wt (mt)	4,497	3,777	4,330	4,121	3,347	2,919
		Exvessel Rev (1000's $)	3,552	3,402	3,422	3,561	3,062	3,054
Midwater Trawl	CA	Landed wt (mt)	5,839	2,792	2,870	1,705	4,781	3,095
		Exvessel Rev (1000's $)	1,670	683	381	173	676	366
	OR	Landed wt (mt)	73,313	55,516	32,772	36,621	59,239	61,636
		Exvessel Rev (1000's $)	10,552	6,274	3,709	3,728	4,889	7,298
	WA	Landed wt (mt)	13,252	18,848	14,670	13,071	25,972	32,688
		Exvessel Rev (1000's $)	2,171	2,355	1,828	1,321	2,078	3,985
Total Landed wt (mt)			117,152	98,388	70,513	73,296	109,482	116,677
Total Exvessel Rev (1000's $)			42,402	34,294	28,962	30,204	29,345	33,946

Source: PacFIN FTL table. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-13. Shoreside Groundfish Landings and Revenue by Trawl and Non-Trawl Vessels.

Gear Group	Data	2000	2001	2002	2003	2004	2005
Non-Trawl	Landed Weight (mt)	4,163	3,561	3,051	3,347	3,456	3,949
	Landed Revenue (1000's $)	16,997	14,326	12,039	14,626	14,086	16,909
Trawl	Landed Weight (mt)	117,152	98,388	70,513	73,296	109,482	116,677
	Landed Revenue (1000's $)	42,402	34,294	28,962	30,204	29,345	33,946
Trawl Portion	Landed Weight (mt)	0.97	0.97	0.96	0.96	0.97	0.97
	Landed Revenue (1000's $)	0.71	0.71	0.71	0.67	0.68	0.67

Source: PacFIN ftl data. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-14 . Depth Based Distribution of Landed Groundfish Catch by Limited Entry Trawl Vessels Using Midwater or Bottom Trawl Gear (Pounds by Year and Depth Range).

Depth Range (fathoms)	2001	2002	2003
0-50	22,930,260	40,048,627	15,919,762
51-100	215,155,125	158,543,798	135,411,711
101-150	62,788,477	45,254,962	61,445,691
151-200	13,325,986	7,713,513	18,157,965
201-250	8,322,800	6,198,206	12,817,069
>250	20,664,041	23,096,810	30,265,559

Source: PacFIN logbook data. July 2005

Note: not all logbook records have an associated depth and depth is recorded as the average or start tow depth.

Table 7-15. Monthly Distribution of Groundfish Landed Catch by Limited Entry Trawl Vessels Using Midwater or Bottom Trawl Gear (Pounds by Month and Year).

	Year		
Month	2001	2002	2003
January	5,280,981	4,051,019	4,589,094
February	6,560,832	5,870,089	5,062,798
March	7,103,004	6,090,047	3,726,461
April	11,361,478	9,881,215	9,423,497
May	13,248,925	11,022,904	10,856,262
June	56,177,784	97,157,431	114,340,896
July	115,519,050	113,615,466	103,952,685
August	89,458,920	20,530,848	13,742,628
September	32,274,454	3,193,638	8,614,816
October	2,661,432	6,597,853	4,965,831
November	3,091,795	4,987,239	4,241,793
December	2,001,895	2,465,965	1,990,757

Source: PacFIN logbook data. July 2005

Table 7-16. Landed Weight (lbs) of Groundfish Made by Trawl Vessels by Port and Year.

PORT	2000	2001	2002	2003	2004
ASTORIA	15,733,074	12,128,458	8,265,559	9,742,986	11,691,379
AVILA	834,680	616,016	1,563,590	1,542,126	982,240
BELLINGHAM BAY	5,567,902	4,250,213	5,239,046	4,971,017	3,356,161
BROOKINGS	2,564,206	1,942,570	1,263,150	1,973,492	1,070,491
CHARLESTON (COOS BAY)	8,753,192	6,613,222	4,692,898	6,261,152	5,307,643
CRESCENT CITY	2,867,758	2,613,821	2,789,286	1,903,833	1,089,460
EUREKA	4,113,867	4,065,846	3,905,964	4,373,074	3,696,474
FIELDS LANDING	2,448,302	1,241,606			
FORT BRAGG	4,055,532	3,429,009	4,506,717	3,028,961	2,902,846
MONTEREY	862,084	692,836	573,330	547,952	409,290
MORRO BAY	285,861	195,718	167,050	248,413	777,682
MOSS LANDING	1,350,408	1,321,558	1,447,451	2,039,384	1,138,278
NEAH BAY	2,332,979	1,422,344	36,017	1,906,337	616,595
NEWPORT	7,918,289	5,823,743	4,023,203	4,997,183	4,414,402
PORT ANGELES	170,573	80,998	2,550,679		396,169
PRINCETON / HALF MOON BAY	1,537,386	1,210,273	927,221	651,677	561,930
SAN FRANCISCO	2,067,686	1,677,797	1,294,075	1,311,881	1,820,147
SANTA BARBARA	10,314	6,514	12,914	965	8,356
SANTA CRUZ	100,694	58,211	25,959	10,172	4,524
VENTURA	1,785	4,680	3,131	683	344
WESTPORT	1,803,584	1,873,952	9,075,180	1,032,300	1,006,859

Note: ports with fewer than three trawl vessels in any year were excluded for confidentiality purposes
Source: PacFIN ft and ftl tables

.

Table 7-17. Largest Ports for Limited Entry Trawl Vessel Groundfish Landings and Exvessel Revenue (2000–2003).

Rank	Rank by Weight	Rank by Exvessel Revenue
1	NEWPORT	ASTORIA
2	ASTORIA	NEWPORT
3	WESTPORT	CHARLESTON (COOS BAY)
4	CHARLESTON (COOS BAY)	WESTPORT
5	ILWACO	BROOKINGS
6	EUREKA	BELLINGHAM BAY
7	CRESCENT CITY	NEAH BAY
8	BROOKINGS	PRINCETON / HALF MOON BAY
9	BELLINGHAM BAY	EUREKA
10	NEAH BAY	BLAINE
11	FIELDS LANDING	CRESCENT CITY
12	PRINCETON / HALF MOON BAY	ILWACO
13	BLAINE	SAN FRANCISCO
14	SAN FRANCISCO	FIELDS LANDING
15	PORT ANGELES	GARIBALDI (TILLAMOOK)

Source: PacFIN FTL table. July 2004

Table 7-18. 1998-2005 Pacific Whiting Non-Tribal At-Seas Processing Vessels.

GROUNDFISH	WEIGHT (mt)							
	1998	1999	2000	2001	2002	2003	2004	2005
Pacific whiting	120,452	115,259	114,655	94,451	62,935	67,236	97,277	127,461
Pacific cod	0	0.04	0.19	0	0	0.25	0.02	0.01
Lingcod	0.11	0.06	0.41	0.66	0.27	0.49	1.18	2.42
Sablefish	27.83	2.1	47.13	21.5	21.02	16.95	28.71	15.13
Arrowtooth	1.04	3.21	8.61	3.76	2.17	2.86	1.12	1.26
Dover sole	0.01	0	0.27	1.53	0.65	0.85	0.14	0.38
English sole	0	0.02	0.22	0.1	0.11	0.02	0.02	0.06
Petrale sole	0	0	0	0	0	0	0	0
Rex sole	0.36	0.02	5.54	18.32	11.51	6.71	1.89	3.18
Rock sole	0	0	0	0	0	0	0	0
Starry flounder	0	0	0	0	0	0	0	0
All other flatfish spp (except hal.)	0.01	0.01	1.32	7.05	0.15	0.18	0.02	0.01
Bocaccio	1.21	0.32	2.65	0.29	0.19	0.06	0.16	0.28
Canary	2.72	1.22	1.42	1.61	2.41	0.26	4.6	1.04
Chilipepper	0.01	0.54	4.83	3.57	4.9	1.26	1.97	1.15
Darkblotched		12.07	3.13	4.31	7.38	11.02		
POP	21.28	14.15	9.61	19.74	3.62	5.16	1.05	1.64
Shortbelly	0.02	0	0.86	27.33	0.6	0.51	0.02	2.69
Thornyhead	2.51	0.02	19.07	15.21	11.91	15.65	5.64	7.09
Widow rockfish	292.76	148.95	220.62	168.91	135.6	12.25	19.8	78.65
Yellowtail	376.98	684.13	555.56	124.99	14.28	2.32	18.49	72.96
Yelloweye		0	0	0	0			
Other rockfish spp	62.36	33.15	120.34	66.15	20.54	24.74	25.83	59.22
Other groundfish	218.07	254.05	92.46	89.18	38.82	14.33	349.89	94.81
TOTAL GROUNDFISH	121,689	116,401	115,746	95,033	63,207	67,345	97,738	127,813
CPS SPECIES								
Pacific mackerel	458.78	1.47	15.52	47.29	0.04	0	0	0.03
Jack mackerel	229.14	53.84	52.98	107.43	6.85	12.38	58.07	4.44
Pacific sardine	1.94	0.18	0.06	0.23	0.01	0	0	0.04

Table 7-19. Non-Tribal Harvests and Revenues.

2005 'Metric tons of Whiting and select rockfish in non-tribal at sea

ROCKFISH SPECIES	MOTHERSHIP	CATCHER/PROCESSOR	TOTAL
Bocaccio			
POP	0.86	0.78	1.64
Thornyheads	0.74	6.34	7.09
Canary rockfish	0.7	0.34	1.04
Yellowtail rockfish	25.52	47.44	72.96
Widow rockfish	35.5	43.14	78.65
Chilipepper rockfish	0.89	0.26	1.15
Shortbelly rockfish	2.68	0.01	2.69
Darkblotched rockfish	5.08	5.95	11.02
Other rockfish	18.81	40.42	59.22
Mt whiting	48,571.23	78,889.57	127,460.80
sum	48,662.01	79,034.25	127,696.26
Mt rockfish/mt whiting	0.0019	0.0018	0.0018

2005 'Exvessel value of whiting and select rockfish in non-tribal at sea (assume hake and rockfish PPP are $0.51)

Bocaccio			
POP	97	88	184
Thornyheads	83	713	797
Canary rockfish	79	38	117
Yellowtail rockfish	2,869	5,334	8,203
Widow rockfish	3,991	4,850	8,843
Chilipepper rockfish	100	29	129
Shortbelly rockfish	301	1	302
Darkblotched rockfish	571	669	1,239
Other rockfish	2,115	4,545	6,658
whiting value	5,461,136	8,869,998	14,331,134
Sum	5,471,343	8,886,265	14,357,608

Table 7-20. Month At-Sea Harvests.

Sum of Weight (kg)				
YEAR	Calendar month	Catcher/proc.	Mothership	Tribal Mothership
2001	May	10,593,363	23,743,292	
	June	12,585,083	7,463,645	
	July	5,258,001	1,809,551	
	August	6,319,107		
	September	6,493,754		1,654,963
	October	12,431,475		4,427,861
	November	4,949,718		
2001 Total		58,630,502	33,016,488	6,082,823
2002	May	15,707,176	21,432,124	
	June		5,131,053	3,901,774
	July	3,892,390		10,354,934
	August	8,420,572		7,253,635
	September	5,520,573		
	October	2,714,559		
2002 Total		36,255,268	26,563,177	21,510,342
2003	May	9,933,710	21,606,979	
	June	4,539,275	3,748,690	6,218,430
	July	5,528,418		8,329,453
	August	7,621,855		4,719,978
	September	10,365,322		
	October	3,202,512		
2003 Total		41,191,091	25,355,669	19,267,862
2004	May	16,553,683	19,932,828	
	June	8,706,707	4,117,461	6,299,350
	July			

		5,922,489		10,991,465
	August	8,147,306		6,030,633
	September	17,863,890		
	October	12,336,267		
	November	3,463,771		
2004 Total		72,994,113	24,050,290	23,321,448
2005	May	22,984,025	25,222,321	
	June	15,305,174	12,422,829	9,156,457
	July	7,991,038		10,529,339
	August	9,938,277		3,730,258
	September	14,100,781		
	October	8,554,089	5,849,297	
	November		5,063,628	
2005 Total		78,873,383	48,558,075	23,416,054

Table 7-21. Count of Limited Entry Vessels Making Landings with Hook and Line or Pot Gear by State, Year, and Vessel Length.

		Vessel Length (feet)						
State	Year	< 40	40 - 49	50 - 59	60 - 69	70–79	80 - 89	> 89
CA	2000	23	25	14	2			
	2001	13	28	9	2			
	2002	14	23	10		2		
	2003	14	18	8				
OR	2000	24	46	18	14		1	
	2001	17	31	16	13	1	1	1
	2002	15	19	14	11		1	
	2003	15	21	10	9	1	2	1
WA	2000	11	21	16	5	2	1	
	2001	6	18	13	3	2	1	
	2002	7	14	10	6	2	1	
	2003	7	16	13	5	2	1	

Source: PacFIN FTL table. July 2004

Table 7-22. Landings and Exvessel Revenue made by Limited Entry Vessels with Fixed Gear by State and Year (Hkl and Pot Gear).

			Year					
State	Species Aggregation	Data Type	2000	2001	2002	2003	2004	2005
CA	Non-Sablefish Groundfish	Landed Weight (mt)	253	247	239	276	260	290
		Exvessel $ (1000's)	1,089	974	938	1,264	1,362	1,315
	Sablefish	Landed Weight (mt)	549	436	352	390	396	393
		Exvessel $ (1000's)	1,867	1,448	1,146	1,509	1,325	1,391
OR	Non-Sablefish Groundfish	Landed Weight (mt)	74	103	51	38	33	34
		Exvessel $ (1000's)	243	367	200	117	90	77
	Sablefish	Landed Weight (mt)	984	703	435	603	849	864
		Exvessel $ (1000's)	4,875	3,426	2,279	3,339	3,430	4,085
WA	Non-Sablefish Groundfish	Landed Weight (mt)	384	260	450	228	183	293
		Exvessel $ (1000's)	240	162	221	120	109	175
	Sablefish	Landed Weight (mt)	382	346	285	481	496	612
		Exvessel $ (1000's)	2,477	2,139	1,874	3,195	2,753	3,596

Source: PacFIN FTL table. May 2006

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-23. Limited Entry Vessel Groundfish Landings made with Fixed Gear by Month and Year.

	Year							
	2000		2001		2002		2003	
Mth	Landed wt (lbs)	Revenue ($)	Landed wt (lbs)	Revenue ($)	Landed wt (lbs)	Revenue ($)	Landed wt (lbs)	Revenue ($)
1	67,326	132,487	90,463	119,114	132,364	163,145	112,472	215,344
2	108,890	71,447	152,470	154,001	222,151	169,911	139,408	170,878
3	151,900	141,260	136,058	201,181	317,009	243,697	171,134	214,311
4	256,103	190,067	195,109	198,431	445,992	399,176	357,136	396,859
5	361,945	246,369	310,071	269,816	578,767	763,776	489,877	976,868
6	172,531	211,962	141,985	233,775	373,550	716,493	573,040	1,403,875
7	144,956	265,388	208,843	315,779	336,405	754,497	678,224	1,592,493
8	3,616,594	7,790,820	1,147,999	2,404,248	442,965	968,219	546,730	1,313,028
9	387,210	778,563	1,322,139	2,734,656	576,482	1,246,036	817,926	1,965,899
10	205,454	374,881	764,189	1,622,828	387,172	883,103	405,198	942,079
11	180,519	335,921	94,793	162,831	118,599	222,777	111,521	249,621
12	137,895	252,048	54,052	98,561	62,708	127,611	44,003	102,500

Source: PacFIN VSMRFD files. July 2004

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-24. Largest Ports for Limited Entry Fixed Gear Landings and Exvessel Revenue (2000-2003).

Rank	Top Ports for Exvessel Revenue	Top Ports for Landings
1	NEWPORT	BELLINGHAM BAY
2	BELLINGHAM BAY	NEWPORT
3	ASTORIA	MOSS LANDING
4	CHARLESTON (COOS BAY)	ASTORIA
5	MOSS LANDING	PORT ORFORD
6	WESTPORT	CHARLESTON (COOS BAY)
7	PORT ORFORD	WESTPORT
8	PORT ANGELES	PORT ANGELES
9	EUREKA	EUREKA
10	CRESCENT CITY	CRESCENT CITY
11	OCEANSIDE	SAN FRANCISCO
12	FORT BRAGG	FORT BRAGG
13	SAN FRANCISCO	OCEANSIDE
14	FLORENCE	FLORENCE
15	SEATTLE	NEWPORT BEACH

Source: PacFIN FTL table. July 2004

Table 7-25. Number of open access vessels by level of dependency and vessel length (based on data from November 2000 - October 2001).

	<40'	40'-50'	50'-60'	60'-70'	70'-150'	Unspecified	Total
<5%	324	109	29	28	25	1	516
>5% &<35%	154	32	6	4	1	0	197
>35% &<65%	96	8	1	0	0	0	105
>65% &<95%	115	5	0	0	1	3	124
>95% &<100%	310	21	5	2	0	7	345

Extracted from table 6-18a DEIS, Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 Pacific Coast Groundfish fishery
a/ open access vessels with more than half of their total landings value coming from groundfish are considered to be in the directed fishery

Table 7-26. **Open access groundfish landings by gear group, 2000-2003 (based on 8/24/04 PacFIN data).**

Open Access Gear Group	Number of Vessels Landing Groundfish	Landed Groundfish Weight (mt)	Exvessel Revenue Groundfish ($)	Exvessel Revenue per Vessel ($)
Longline - all groundfish a\				
2000	399	435	1,847,800	4,627
2001	392	408	1,656,395	4,221
2002	287	349	1,268,537	4,422
2003	307	507	1,728,038	5,625
Average	346	425	1,625,193	4,724
Longline - groundfish directed b\				
2000	133	399	1,679,851	12,619
2001	115	367	1,466,101	12,765
2002	96	318	1,129,437	11,733
2003	113	469	1,541,727	13,610
Average	114	388	1,454,279	12,682
Longline - CA Halibut				
2000	4	3	24,226	6,057
2001	2	3	29,774	14,887
2,002	2	1	5,352	2,676
2,003	0	0	0	0
Average	2	2	19,784	7,873
Pot - groundfish directed c\				
2,000	28	164	834,087	29,789
2,001	34	145	720,680	21,196
2,002	35	124	573,289	16,380
2,003	41	194	763,732	18,628
Average	35	157	722,947	21,498
Pot - Dungeness crab				

2000	71	45	165,638	2,333
2001	63	29	124,674	1,979
2002	63	34	149,311	2,370
2003	61	39	173,518	2,845
Average	65	37	153,285	2,382
Pot - prawn/shrimp				
2000	12	1	3,973	331
2001	10	5	21,569	2,157
2002	8	1	9,869	1,234
2003	7	6	25,635	3,662
Average	9	3	15,262	1,846
Pot - sheephead				
2000	49	4	43,446	887
2001	40	3	30,770	769
2002	36	9	58,951	1,638
2003	22	1	14,542	661
Average	37	5	36,927	989
Trawl - sea cucumber				
2,000	3	0.1	189	63
2,001	10	0.8	1,649	165
2,002	8	0.8	2,962	370
2,003	6	0.3	650	108
Average	7	1	1,363	177
Trawl - CA halibut				
2,000	24	22	38,697	1,612
2,001	30	7	12,324	411
2002	21	6	12,961	617
2003	15	2	5,513	368
Average	23	9	17,374	752
Trawl -Ridgeback Prawn				
2000	28	11	28,468	1,017

2001	0	0	0	0
2002	0	0	0	0
2003	0	0	0	0
Average	--	--	--	--
Line gear - all groundfish a/				
2000	1,180	391	2,029,516	1,720
2001	1,175	418	2,136,846	1,818
2002	881	406	2,178,544	2,474
2003	641	326	1,614,643	2,521
Average	969	385	1,989,887	2,133
Line gear - CA halibut				
2,000	< 285	10	32,419	114
2,001	< 270	7	31,471	117
2002	< 250	5	31,333	125
2,003	< 245	6	40,284	164
Average	< 263	7	33,877	129
Line gear - Salmon troll (coastwide)				
2,000	304	17	37,806	124
2001	229	14	27,860	122
2,002	212	10	25,336	120
2003	220	9	19,604	89
Average	241	12	27,651	115
Line gear - Salmon troll (north only)				
2000	163	11	24,280	149
2001	177	11	19,014	107
2002	152	6	13,742	90
2003	154	6	11,304	73
Average	162	9	17,085	106
Net gear - CPS				
2000	3	2	738	369

2001	1	0	2	1
2002	1	0	14	14
2003	3	0	52	17
Average	2	1	213	100

a/ multiple records exist for landings with HKL gear that do not have an associated vessel id. The vessel count in this case is an estimate

b/ annual revenue of $2,500 is used as a proxy for vessels that had efforts directed at groundfish

c\ if ≥20% of revenue was from groundfish, a vessel was assumed to have target groundfish at some point during the year

Table 7-27. Open Access Groundfish Landings and Exvessel Revenue by Year, State, and Species.

			Year			
State	Species Aggregation	Data Type	2000	2001	2002	2003
CA	Flatfish and Skates	Landed Weight (lbs)	93,158	48,856	42,579	15,140
		Exvessel Revenue ($)	87,688	63,929	61,621	20,649
	Rockfish(a)	Landed Weight (lbs)	705,190	652,021	486,113	461,812
		Exvessel Revenue ($)	1,789,851	1,750,273	1,259,855	1,027,475
	Other Groundfish	Landed Weight (lbs)	300,719	253,393	185,577	169,155
		Exvessel Revenue ($)	1,070,487	775,543	533,652	506,268
	Sablefish	Landed Weight (lbs)	657,104	558,217	541,963	675,694
		Exvessel Revenue ($)	928,945	766,276	691,173	877,637
OR	Flatfish and Skates	Landed Weight (lbs)	310	22,435	1,034	1,750
		Exvessel Revenue ($)	69	12,341	159	391
	Rockfish(a)	Landed Weight (lbs)	241,363	455,647	309,452	260,633
		Exvessel Revenue ($)	292,445	428,552	478,855	329,766
	Other Groundfish	Landed Weight (lbs)	123,930	176,758	242,546	150,631
		Exvessel Revenue ($)	329,379	462,625	678,185	399,524
	Sablefish	Landed Weight (lbs)	88,627	129,954	96,044	280,209
		Exvessel Revenue ($)	166,725	247,306	188,163	528,151
WA	Flatfish and Skates	Landed Weight (lbs)	2,899	6,052	3,045	23,268
		Exvessel Revenue ($)	814	1,453	1,067	4,533
	Rockfish(a)	Landed Weight (lbs)	172,836	338,792	670,658	662,355
		Exvessel Revenue ($)	80,701	164,664	323,228	319,673
	Other Groundfish	Landed Weight (lbs)	31,187	26,426	36,572	369,093
		Exvessel Revenue ($)	15,785	15,262	20,284	172,052
	Sablefish	Landed Weight (lbs)	73,567	89,021	99,063	181,340
		Exvessel Revenue ($)	206,543	220,195	259,410	493,547
Total Landed Weight (lbs)			2,490,890	2,757,572	2,714,646	3,251,080
Total Exvessel Revenue ($)			4,969,432	4,908,419	4,495,652	4,679,666

a) The “Rockfish” aggregation includes thornyheads and scorpionfish

Source: PacFIN VSMRFD files. July 2004

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-28. Open Access Groundfish Landings and Exvessel Revenue by State, Year, and Gear Group.

			Year					
ST	Gear Group	Data Type	2000	2001	2002	2003	2004	2005
CA	Dredge	Landings (lbs)			C		C	
		Exvessel Rev ($)			C		C	
	Hook & Line	Landings (lbs)	1,218,626	1,053,789	865,280	818,292	1,032,803	1,086,931
		Exvessel Rev ($)	2,871,120	2,521,246	1,864,774	1,644,510	2,426,583	2,553,372
	Misc.	Landings (lbs)	2,140	148	229	63	C	752
		Exvessel Rev ($)	3,151	448	1,154	65	C	414
	Net	Landings (lbs)	100,870	128,117	98,048	106,461	137,342	122,878
		Exvessel Rev ($)	85,625	106,763	88,543	97,987	121,674	82,465
	Pot	Landings (lbs)	361,750	305,553	263,532	387,890	428,590	647,384
		Exvessel Rev ($)	852,555	704,248	557,881	677,169	702,521	955,741
	Shrimp Trawl	Landings (lbs)	18,084	8,932	8,508	4,532	37,830	71,780
		Exvessel Rev ($)	18,753	10,806	11,885	7,045	51,856	74,067
	Non-Shrimp Trawl	Landings (lbs)	54,701	15,949	19,232	4,563	29,299	32,500
		Exvessel Rev ($)	45,766	12,511	20,727	5,253	46,843	53,764
OR	Hook & Line	Landings (lbs)	421,803	563,759	615,247	642,047	623,011	920,239
		Exvessel Rev ($)	749,701	995,381	1,280,502	1,160,157	1,076,475	1,668,813
	Net	Landings (lbs)	C	C	C	C		
		Exvessel Rev ($)	C	C	C	C		
	Pot	Landings (lbs)	10,449	28,488	24,453	41,978	20,547	105,306
		Exvessel Rev ($)	19,093	54,702	57,569	89,877	41,758	163,988
	Shrimp Trawl	Landings (lbs)	21,978	19,527	9,376	8,904	3,749	140
		Exvessel Rev ($)	19,824	15,193	7,291	7,785	1,277	57
	Non-Shrimp Trawl	Landings (lbs)		173,020				
		Exvessel Rev ($)		85,548				
WA	Hook & Line	Landings (lbs)	182,386	206,037	184,726	376,393	470,624	334,782
		Exvessel Rev ($)	258,062	278,436	303,130	538,521	464617	540,182
	Net	Landings (lbs)	C	C	C	C		
		Exvessel Rev ($)	C	C	C	C		
	Pot	Landings (lbs)	864	477		11,132	10,080	106,979
		Exvessel Rev ($)	1,817	1,284		28,035	15,924	169,302
	Shrimp Trawl	Landings (lbs)	23,355	17,145	20,332	25,063	125	97
		Exvessel Rev ($)	11,537	9,774	12,577	12,905	49	54
	Non-Shrimp Trawl	Landings (lbs)	73,597	236,614	604,280	823,468	22,909	121,131
		Exvessel Rev ($)	32,382	112,078	288,282	410,344	17,207	6,491
Total Landed Weight (lbs)			2,490,891	2,757,572	2,714,645	3,251,081	2,816,909	3,550,899
Total Exvessel Revenue ($)			4,969,431	4,908,420	4,495,652	4,679,666	4,950,860	3,546,036

Source: PacFIN VSMRFD and Ext_trips_pfmc files. July 2004 and May 2006
Note: C represents data restricted due to confidentiality
Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table7-29. Open Access Groundfish Landings and Exvessel Revenue by Year and Month.

		Year			
Month	Data Type	2000	2001	2002	2003
Jan	Landed Weight (lbs)	93,701	112,254	181,903	110,711
	Exvessel Revenue ($)	145,656	223,168	306,917	205,300
Feb	Landed Weight (lbs)	41,385	165,665	182,796	163,689
	Exvessel Revenue ($)	65,017	302,154	414,606	340,653
Mar	Landed Weight (lbs)	73,791	143,817	252,550	160,549
	Exvessel Revenue ($)	146,782	233,427	336,792	185,578
Apr	Landed Weight (lbs)	159,222	167,204	179,382	245,277
	Exvessel Revenue ($)	288,795	289,676	302,902	254,953
May	Landed Weight (lbs)	183,220	258,256	262,229	292,340
	Exvessel Revenue ($)	375,394	548,591	533,438	579,894
Jun	Landed Weight (lbs)	254,531	261,425	312,602	270,832
	Exvessel Revenue ($)	536,131	500,489	548,528	532,533
Jul	Landed Weight (lbs)	317,609	515,377	273,616	291,337
	Exvessel Revenue ($)	577,348	757,606	476,710	573,222
Aug	Landed Weight (lbs)	293,626	360,067	303,725	344,512
	Exvessel Revenue ($)	683,134	638,477	504,046	549,447
Sep	Landed Weight (lbs)	256,663	306,550	305,507	536,720
	Exvessel Revenue ($)	548,398	538,645	357,348	627,820
Oct	Landed Weight (lbs)	250,241	191,702	184,380	392,800
	Exvessel Revenue ($)	477,569	418,312	315,544	401,556
Nov	Landed Weight (lbs)	271,041	193,812	196,511	359,501
	Exvessel Revenue ($)	522,012	302,037	292,301	344,660
Dec	Landed Weight (lbs)	295,861	81,443	79,445	82,812
	Exvessel Revenue ($)	603,194	155,837	106,519	84,050

Source: PacFIN VSMRFD files. July 2004

Note: Data shown is for PFMC management areas and does not include areas such as Puget Sound and Columbia River for example.

Table 7-30. Top Ports for Open Access Groundfish Landings and Revenue (2000-2003).

Rank	Top 15 Ports for Landed Revenue	Top 15 Ports for Landed Weight
1	MORRO BAY	MOSS LANDING
2	PORT ORFORD	NEAH BAY
3	MOSS LANDING	FORT BRAGG
4	FORT BRAGG	PORT ORFORD
5	GOLD BEACH	PORT ANGELES
6	AVILA	MORRO BAY
7	SANTA BARBARA	GOLD BEACH
8	PORT ANGELES	WESTPORT
9	CRESCENT CITY	EUREKA
10	NEAH BAY	CRESCENT CITY
11	SAN FRANCISCO	ASTORIA
12	MONTEREY	SAN FRANCISCO
13	ASTORIA	AVILA
14	EUREKA	CHARLESTON (COOS BAY)
15	WESTPORT	BROOKINGS

Source: PacFIN VSMRFD files. July 2004

Table 7-31. Tribal Shoreside Landings and Exvessel Revenue by Species Group and Year.

		Year				
Species Group	Data Type	2000	2001	2002	2003	2004
CPS	Landed weight (lbs)				C	
	Exvessel revenue ($)				C	
Crab	Landed weight (lbs)	922,909	665,443	1,804,399	1,420,102	2,672,525
	Exvessel revenue ($)	1,957,757	1,292,271	3,240,886	2,660,939	5,704,007
Groundfish	Landed weight (lbs)	1,152,546	1,274,750	1,675,078	11,808,437	18,689,384
	Exvessel revenue ($)	2,625,809	2,589,479	2,034,776	3,639,098	4,082,579
HMS	Landed weight (lbs)		15,110	21,664	37,950	15,301
	Exvessel revenue ($)		11,876	11,645	33,456	11,162
Other	Landed weight (lbs)	281,820	418,480	480,185	485,509	537,583
	Exvessel revenue ($)	747,950	840,983	949,711	1,271,393	1,506,766
Salmon	Landed weight (lbs)	236,966	735,977	573,684	513,772	1,090,256
	Exvessel revenue ($)	282,162	631,997	444,341	512,614	1,648,124
Shellfish	Landed weight (lbs)	C			C	C
	Exvessel revenue ($)	C			C	C
Sum of weight (lbs)		2,594,241	3,109,760	4,555,010	14,265,770	23,005,049
Sum of revenue (lbs)		5,613,678	5,366,607	6,681,358	8,117,501	12,952,638

Source: PacFIN FTL table. September 2005
Note: Totals do not include confidential data

Table 7-32. Tribal Shoreside Landings by Gear Type and Year.

		Year				
Gear Type	Data	2000	2001	2002	2003	2004
Hook and Line	Landed weight (lbs)	1,317,524	1,406,585	1,125,842	1,362,733	1,623,791
	Exvessel revenue ($)	3,264,578	3,296,352	2,470,980	3,423,539	3,942,738
Misc.	Landed weight (lbs)	C			C	C
	Exvessel revenue ($)	C			C	C
Net	Landed weight (lbs)	55,731	119,043	11,810	5,412	4,597
	Exvessel revenue ($)	66,020	84,960	8,185	4,950	4,720
Pot	Landed weight (lbs)	943,559	665,443	1,804,399	1,420,102	2,672,525
	Exvessel revenue ($)	2,022,219	1,292,271	3,240,886	2,660,939	5,704,007
Troll	Landed weight (lbs)	198,984	656,317	600,689	567,302	1,143,716
	Exvessel revenue ($)	226,440	569,236	457,477	553,069	1,696,708
Trawl	Landed weight (lbs)	78,443	262,372	1,012,270	10,910,311	17,560,420
	Exvessel revenue ($)	34,420	123,789	503,830	1,475,040	1,604,465
Total Sum of weight (lbs)		2,594,241	3,109,760	4,555,010	14,265,860	23,005,049
Total Sum of revenue ($)		5,613,678	5,366,607	6,681,358	8,117,538	12,952,638

Source: PacFIN FTL table. July 2004
Note: Totals do not include confidential data
* for crab only

Table 7-33. West Coast groundfish catch (At-sea and Shoreside) in ocean areas by tribal fleet: 1995 through 2005 (round weight lbs).

Species	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
ARROWTOOTH FLOUNDER	240	3		255	13,195	331	961	7,137	49,700	180,500	349,100
DOVER SOLE	1,764	2,441	1,268	4,509	11,594	2,030	4,619	35,417	72,500	184,200	319,600
ENGLISH SOLE		4	118	1,847	593	996	7,103	88,684	149,300	178,700	144,700
PETRALE SOLE		5	12	3,249	545	80	1,954	45,479	185,700	185,400	65,400
REX SOLE					26	151	1,358	6,632	10,900	15,100	30,200
ROCK SOLE				2,396	16		22	5,833	5,200	5,400	5,100
UNSP. FLATFISH				38	775		437	8,406	6,400	14,800	64,400
UNSPECIFIED SANDDAB							1,599	19,655	1,700	800	2,600
SAND SOLE		12	40				269	2,748	62	2,000	1,000
STARRY FLOUNDER		22	54				3	301	20	5,000	2,800
BUTTER SOLE								605			
Flatfish Total	2,004	2,487	1,492	12,294	26,744	3,588	18,325	220,897	481,482	771,900	984,900
BOCACCIO				2	38	145	449				
NOM. CANARY ROCKFISH	59	171	26	609	1,033	539	4,064	7,071	3,200	6,800	9,500
CANARY ROCKFISH				277	252	330	1,380				
NOM. DARKBLOTCHED ROCKFISH									32	300	200
DARKBLOTCHED ROCKFISH				0	36	76	226	3,273			
GREENSTRIPED ROCKFISH				1	51	16	0				
PACIFIC OCEAN PERCH				0	110	20	16				
REDBANDED ROCKFISH				1	128	492	0				
REDSTRIPE ROCKFISH				1	63	131	1,510				
ROUGHEYE ROCKFISH				1	80	76	1,529				
ROSETHORN ROCKFISH				0	0		0				
SHARPCHIN ROCKFISH				1	9	10	85				
SILVERGREY ROCKFISH				0	36	4	12				
UNSP. POP GROUP		3			104			472	200	8,500	7,500
UNSP. ROCKFISH	114,684	79,545	65,121	65,245	59,875	45,953					
WIDOW ROCKFISH				54	411	2,010	16,265				
NOM. WIDOW ROCKFISH					53	3	51	27,969	20,600	47,300	63,000
NOM. YELLOWEYE ROCKFISH									600	1,700	1,800
YELLOWEYE ROCKFISH					68	3	2	0			
NOM. YELLOWTAIL ROCKFISH	519	1,297	2,471	10,448	28,671	9,585	7,598	572,996	602,200	775,300	1,189,100
YELLOWTAIL ROCKFISH				3,263	6,498	68,463	210,006	0			
Unsp. Shelf Rockfish						3,099	20,503	23,629	6,500	9,900	20,500
Unsp. Near-Shore Rockfish						10	58	116	73	200	500
Unsp. Slope Rockfish						19,891	54,920	32,941	42,100	50,300	63,000

BLACKGILL ROCKFISH							19				
SHORTRAKER ROCKFISH							289				
Rockfish Total	115,262	81,016	67,618	79,903	97,516	150,856	318,982	668,467	675,504	900,300	1,355,100
SPINY DOGFISH		5,521			881	6,251		2,607	8,400	88,300	13,100
LINGCOD	2,873	2,732	1,648	5,247	7,051	6,817	9,429	24,854	49,200	52,500	65,800
PACIFIC COD	2,814	1,540	2,166	4,873	2,677	4,573	8,712	128,530	471,500	678,300	272,600
SABLEFISH	1,696,098	1,881,702	1,775,108	980,719	1,566,260	1,555,808	1,451,522	959,982	1,328,100	1,563,500	1,538,500
UNSPECIFIED SKATE	2,517	1,689	1,017	2,031	2,169	1,920	1,407	18,635	47,200	19,400	51,200
NOMINAL SHORTSPINE THORNYHEAD	15,697	16,010	16,892	7,606	13,251	8,987	10,945	10,499	12,700	14,200	23,800
SHORTSPINE THORNYHEAD				471	240		27				
NOMINAL LONGSPINE THORNYHEAD	1,305	538	139	28					300		400
WALLEYE POLLOCK									257,600	101,200	43,200
Other Groundfish Total	1,721,304	1,909,732	1,796,970	1,000,975	1,592,529	1,584,356	1,482,042	1,145,107	2,175,000	2,517,400	2,008,600
PACIFIC WHITING		33,069,648	54,763,337	54,033,600	56,768,061	13,781,257	13,404,001	45,867,384	51,706,688	63,157,381	75,743,442
All Groundfish Species Total	1,838,570	35,062,883	56,629,417	55,126,772	58,484,850	15,520,057	15,223,350	47,901,855	55,038,674	67,346,981	80,092,042

Table 7-34. West Coast Groundfish Catch (At-Sea and Shoreside) in Ocean Areas by Tribal Fleet: 1995 Through 2005 (Exvessel Revenue $).

Species	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Arrowtooth Flounder	24	1		26	1,319	33	111	715	5,336	17,738	36,375
Dover Sole	570	768	393	1,478	3,817	663	1,498	11,335	23,215	60,293	112,660
English Sole		1	106	613	220	309	2,726	29,289	49,788	59,394	46,979
Petrale Sole		8	8	3,249	545	84	1,692	46,509	191,963	191,978	66,263
Rex Sole					8	51	471	2,316	3,765	5,250	12,641
Rock Sole				791	5		7	2,033	1,716	1,823	1,744
Unsp. Flatfish				13	271		145	2,773	2,106	4,927	21,296
Unspecified Sanddab							372	5,110	455	263	667
Sand Sole		9	30				204	2,084	47	1,489	630
Starry Flounder		7	16				1	98		1,591	854
Butter Sole								206			
Flatfish Total	594	794	553	6,170	6,185	1,140	7,227	102,468	278,391	344,746	300,109
Bocaccio				1	13	64	207				
Nom. Canary Rockfish	20	60	12	230	372	196	1,901	3,329	1,512	3,238	4,239
Canary Rockfish				97	89	145	655				
Nom. Darkblotched									12	142	62
Darkblotched Rockfish				0	12	33	104	1,477			
Greenstriped Rockfish				0	18	7	0				
Pacific Ocean Perch				0	38	9	7	0			
Redbanded Rockfish				0	44	216	0				
Redstripe Rockfish				0	22	58	689				
Rougheye Rockfish				0	27	33	705				
Rosethorn Rockfish				0	0		0				
Sharpchin Rockfish				0	3	4	39				
Silvergrey Rockfish				0	12	2	5				
Unsp. Pop Group		1			36			212	89	3,852	3,445
Unsp. Rockfish	48,130	32,345	26,723	26,575	25,334	20,737					
Widow Rockfish				19	143	883	7,801	0			
Nom. Widow Rockfish					19	1	16	13,425	9,880	22,618	29,949
Yelloweye Rockfish					24	2	0	0			
Nom. Yelloweye Rockfish									885	1,790	1,876

Nom. Yellowtail Rockfish	189	438	864	3,542	10,256	3,429	3,379	274,509	288,611	368,860	569,781
Yellowtail Rockfish				1,142	2,275	30,124	99,901				
Unsp. Shelf Rockfish						1,758	13,068	9,794	2,623	3,907	8,323
Unsp. Near-shore Rockfish						4	25	14,434	35	103	248
Unsp. Slope Rockfish						8,238	22,558	55	18,626	22,479	27,835
Blackgill Rockfish							9				
Shortraker Rockfish							134				
Rockfish Total	48,339	32,844	27,599	31,606	38,737	65,943	151,203	317,235	322,273	426,989	645,758
Spiny Dogfish		544			177	830		405	1,138	14,994	2,120
Lingcod	1,404	1,255	731	3,007	4,169	4,065	6,075	18,176	34,555	34,335	44,537
Pacific Cod	1,086	587	818	1,924	1,096	1,987	3,792	63,961	235,122	307,518	123,505
Sablefish	3,046,910	3,003,716	3,162,376	1,280,233	2,045,434	2,544,542	2,411,517	1,512,595	2,187,655	2,476,945	2,440,889
Unspecified Skate	588	120	68	136	145	129	143	2,563	6,303	2,014	6,896
Nom. Shrtsp. Thnyhd.	12,581	15,340	14,828	7,310	10,751	7,199	8,414	8,232	10,601	11,408	15,647
Shortspine Thornyhead				425	215		20				
Nom. Longsp. Thnyhd.	1,057	515	125	25					228		258
Walleye Pollock									136,612	14,021	6,277
Other Groundfish Total	3,063,626	3,022,077	3,178,946	1,293,060	2,061,987	2,558,752	2,429,961	1,605,932	2,612,214	2,861,235	2,640,129
Pacific Whiting		1,651,982	2,735,683	2,699,229	2,838,403	551,250	536,160	2,065,122	2,585,334	1,894,721	3,787,172
All Groundfish Species Total	3,112,559	4,707,697	5,942,781	4,030,065	4,945,312	3,177,085	3,124,551	4,090,757	5,798,212	5,527,691	7,373,168

Table 7-35. Distribution of Vessels Engaged in Tribal Groundfish Fisheries.

Treaty Tribe	Number of Vessels in Groundfish Fishery			Port
	Longline (length in ft)	Trawl (length in ft)	Total	
Makah	35 (33'-62')	10 (49'-62')	41 a/	Neah Bay/West Port
Hoh	1	-	1	La Push
Quileute	7	-	7	La Push
Quinault	10	-	10	West Port
a/ Four Makah vessels participate in both longline and trawl fisheries.				

Source: NMFS. 2004. Groundfish Bycatch Final Programmatic Environmental Impact Statement

Table 7-36. Estimated number of West Coast marine anglers: 2000 - 2002 (thousands).

Year/State	Total	State Residents	Non-Residents	% Non-Residents
2000				
Washington	497	450	47	9.50%
Oregon	365	285	80	21.90%
Northern California	-	388	-	
Southern California	-	1,097	-	
Total California	1,705	1,485	220	12.90%
2001				
Washington	915	861	54	5.90%
Oregon	601	505	97	16.10%
Northern California	-	961	-	
Southern California	-	1,838	-	
Total California	3,084	2,799	285	9.20%
2002				
Washington	1,493	1,399	94	6.30%
Oregon	1,056	845	211	20.00%
Northern California	-	2,022	-	
Southern California	-	3,709	-	
Total California	6,406	5,731	675	10.50%

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

Table 7-37. Charter vessels engaged in saltwater fishing outside of Puget Sound in 2001 by port area.

State	Port Area	Charter Boats
Washington	Neah Bay	1
	La Push	0
	Westport	13
	Ilwaco	6
	Unknown	86
	TOTAL	106
Oregon	Astoria	22
	Tillamook	51
	Newport	45
	Coos Bay	13
	Brookings	15
	Unknown	86
	TOTAL	232
California	Crescent City	1
	Eureka	4
	Fort Bragg	14
	San Francisco	67
	Monterey	33
	Conception (Northern portion)	129
	San Diego	95
	Unknown	72
	TOTAL	415
	GRAND TOTAL	753

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

Table 7-38. Total estimated West Coast recreational marine angler boat trips in 2003 by mode and region (thousands of angler trips).

State/Region	Boat Mode	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Annual Total
WA	Charter	0.0	1.2	16.0	37.8	6.1	0.0	61.1
	Private	22.0	19.5	57.2	32.9	5.0	0.0	136.5
	Total	22.0	20.6	73.2	70.7	11.1	0.0	197.6
OR	Charter	0.8	4.4	27.0	34.2	7.7	0.7	74.8
	Private	31.4	31.2	123.6	108.4	19.4	1.3	315.3
	Total	32.2	35.7	150.6	142.5	27.1	2.0	390.1
N. CA	Charter	3.4	11.3	24.1	73.3	33.0	3.3	148.4
	Private	75.9	83.9	332.5	502.8	211.5	278.2	1,485.0
	Total	79.4	95.2	356.7	576.1	244.6	281.5	1,633.4
S. CA	Charter	32.7	42.0	113.0	256.2	87.3	42.4	573.6
	Private	136.9	192.8	348.2	400.8	331.3	222.5	1,632.5
	Total	169.5	234.8	461.1	657.0	418.6	264.9	2,206.1
Total All States	Charter	36.9	58.9	180.1	401.5	134.1	46.4	857.9
	Private	266.2	327.4	861.5	1,044.9	567.2	502.0	3,569.3
	Total	303.1	386.2	1,041.6	1,446.4	701.3	548.4	4,427.2

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

Table 7-39. Trends in effort for recreational ocean fisheries in thousands of angler trips.

Area	1996	1997	1998	1999	2000	2001a/	2002a/	2003b/
Total Angler Trips								
Washington	51	50	44	49	40	61	56	61
Oregon	54	65	57	60	87	70	62	75
North and Central CA	90	139	158	162	206	221	142	148
Southern CA	982	812	674	609	876	577	438	574
Total	1,177	1,066	933	880	1,218	927	843	858

source: Pacific Fishery Management Council. 2004. Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2005-2006 West Coast Groundfish Fishery. Draft Environmental Impact Statement.

a) The 2001 and 2002 estimates are not directly comparable to previous years due to differences in estimation methodology

b) Preliminary

Table 7-40. Trends in Recreational Angling, Total Trips—All Fisheries Including Groundfish (1000 trips).

		2004	2005
Washington	Private	134	112
	Charter	63	60
	Total	197	172
Oregon	Private	160	115
	Charter	58	35
	Total	218	150
California	Private	536	520
	Charter	689	354
	Total	1225	874
Total	Private	830	747
	Charter	810	449
	Total	1640	1196

Table 7-41. Estimates of Groundfish Trips (# of trips).

	Groundfish Trip Estimates	2004 Charter	2004 Private	2004 Total	2005 Charter	2005 Private	2005 Total
Washington							
	North Washington Coast	187	8147	8334	648	12702	13350
	South and Central Coast	11588	2007	13595	13114	2207	15321
	Total	11775	10154	21929	13762	14909	28671
Oregon							
	Astoria-Tillamook	4677	2508	7185	5139	6169	11308
	Newport	17936	4198	22134	22333	7157	29490
	Coos Bay	4322	3159	7481	4172	5355	9527
	Brookings	4191	11667	15858	4596	16506	21102
	Total	31126	21532	52658	36240	35187	71427
California	North Coast	4909	29898	34807	1265	57161	58426
	North Central Coast	32478	54512	86990	29066	94930	123996
	South Central Coast	41119	44765	85884	27201	65291	92492
	South Coast	112493	34457	146950	85874	46684	132558
	Total	190999	163632	354631	143406	264066	407472
Grand Total		233900	195318	429218	193408	314162	507570

Table 7-42. Count of Buyers Purchasing Fish Caught in PFMC Waters by Year, Species Type, and State (not unique records).

State	Species Group	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CALIFORNIA	Coastal Pelagic	180	166	154	188	209	149	174	127	124	108	159
	Crab	301	236	242	262	294	271	298	307	300	357	473
	Groundfish	529	436	403	444	460	440	412	386	335	310	441
	Highly Migratory	217	185	189	267	269	265	233	241	226	203	231
	Other	582	472	448	498	538	557	558	515	533	515	690
	Salmon	240	240	238	231	264	243	277	225	273	275	343
	Shellfish	94	65	61	42	4	8	6	10	2	2	5
	Shrimp	186	137	153	174	168	157	154	126	136	107	117
OREGON	Coastal Pelagic	13	15	13	15	15	15	14	15	16	16	17
	Crab	90	89	76	72	74	76	67	78	81	84	77
	Groundfish	75	74	78	80	74	72	84	75	79	82	83
	Highly Migratory	93	72	87	99	146	110	96	114	125	143	119
	Other	73	69	80	80	97	86	89	92	103	97	94
	Salmon	69	74	89	83	81	85	104	134	143	154	121
	Shellfish	39	29	13	12	14	19	19	14	46	28	29
	Shrimp	40	40	37	38	39	35	36	37	31	27	25
WASHINGTON	Coastal Pelagic	23	20	19	19	16	11	12	17	16	15	12
	Crab	125	129	123	120	144	129	125	125	158	168	156
	Groundfish	73	51	56	51	50	39	43	42	40	45	42
	Highly Migratory	33	30	30	30	57	38	37	39	55	53	45
	Other	129	105	104	102	115	103	109	102	98	106	106
	Salmon	188	190	184	178	173	161	189	218	219	213	202
	Shellfish	228	246	226	208	207	181	167	180	177	170	194
	Shrimp	60	56	60	71	77	74	75	72	72	80	72

Source: PacFIN ftl and ft tables. December 2005
Note: records are not unique buyers and should not be summed

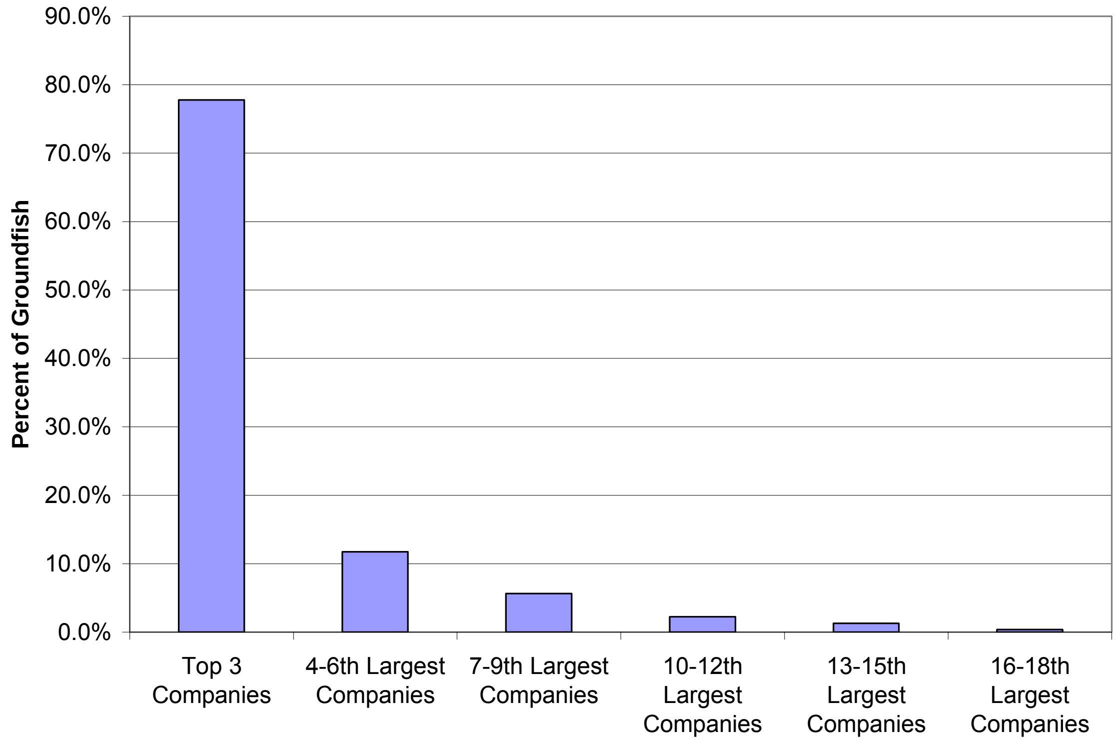
Table 7-43. Number of Dealers by Fishing Sector and State, 1986-2005.

State	Fishery	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
California																					
	Non_Whiting Groundfish Trawl	96	67	63	76	75	86	86	78	85	75	67	62	78	87	51	63	65	55	43	37
	Fixed Gear - Hook&Line and Pot	229	300	306	328	347	340	382	323	335	284	291	320	303	294	286	259	216	200	200	156
	Fixed Gear - Sablefish	34	28	33	48	40	44	66	48	40	52	51	62	43	60	60	53	56	60	48	34
	Whiting_trawl	2	4	3	5	5	3	3	3	4	3	3	4	4	3	4	4	1	2	2	2
	TOTAL (all fisheries)	**507**	**758**	**703**	**725**	**720**	**709**	**687**	**661**	**688**	**588**	**596**	**646**	**693**	**673**	**660**	**616**	**627**	**608**	**592**	**465**
Oregon																					
	Non_Whiting Groundfish Trawl	21	31	25	22	24	26	29	28	29	27	25	22	21	22	18	18	16	13	12	13
	Fixed Gear - Hook&Lne and Pot	50	51	50	62	65	63	65	54	58	50	57	56	54	47	54	47	43	36	42	45
	Fixed Gear - Sablefish	26	23	17	23	20	24	28	24	31	34	36	27	22	28	31	29	29	39	36	30
	Whiting_trawl	6	3	5	1	4	8	6	7	8	9	7	10	7	8	8	7	7	8	5	5
	TOTAL (all fisheries)	**154**	**159**	**152**	**208**	**192**	**170**	**153**	**166**	**161**	**147**	**156**	**159**	**204**	**180**	**179**	**222**	**233**	**246**	**195**	**177**
Washington																					
	Non_Whiting Groundfish Trawl	41	29	35	28	28	27	29	25	20	14	16	15	12	8	12	15	9	8	6	7
	Fixed Gear - Hook&Lne and Pot	60	67	61	58	55	46	47	48	45	32	26	27	22	17	19	13	7	7	8	10
	Fixed Gear - Sablefish	34	23	35	28	27	20	37	29	33	23	32	24	22	24	22	20	18	24	21	19
	Whiting_trawl	5	6	5	5	3	6	5	6	4	4	6	5	4	4	2	3	2	2	3	2
	TOTAL (all fisheries)	**354**	**358**	**363**	**356**	**347**	**367**	**340**	**367**	**273**	**261**	**237**	**236**	**245**	**210**	**229**	**233**	**258**	**277**	**242**	**223**

Table 7-44. Rank of Processing Companies by Volume of Groundfish Purchased on the West Coast in 2004 and 2005.

Company Rank	Percent of Groundfish Landings	Weight of Groundfish Landings (mt)
Top 3 Companies	77.8%	178,222
4-6th Largest Companies	11.7%	26,922
7-9th Largest Companies	5.6%	12,919
10-12th Largest Companies	2.2%	5,119
13-15th Largest Companies	1.3%	2,960
16-18th Largest Companies	0.4%	854

Source: PacFIN ftl and ft tables. December 2005



Source: PacFIN ftl and ft tables. December 2005

Figure 7-2. Rank of Processing Companies by Volume of Groundfish Purchased on the West Coast in 2004 and 2005.

Table 7-45. Seafood Processing Employment and Wage Information by State and Year (information from private entities).

		State			
	Year	Washington	Oregon	California	Sum
Number of employees in seafood product preparation and packaging	2001	7,043	1,093	3,030	11,166
	2002	6,359	1,002	2,530	9,891
	2003	6,391	1,020	2,738	10,149
	2004	6,432	995	2,605	10,032
Number of seafood product preparation and packaging establishments	2001	147	30	69	246
	2002	128	25	62	215
	2003	117	24	65	206
	2004	109	24	65	198
Total wages from seafood product preparation and packaging	2001	$293,322,000	$ 21,478,000	$66,624,000	$ 381,424,000
	2002	$293,013,000	$ 21,178,000	$65,529,000	$ 379,720,000
	2003	$300,751,000	$ 21,115,000	$78,654,000	$ 400,520,000
	2004	$308,261,000	$ 21,507,000	$87,722,000	$ 417,490,000
Average weekly wage from seafood product preparation and packaging	2001	$ 801	$ 378	$ 423	
	2002	$ 886	$ 406	$ 498	
	2003	$ 905	$ 398	$ 552	
	2004	$ 922	$ 416	$ 648	
Average annual wage from seafood product preparation and packaging	2001	$ 41,648	$ 19,653	$ 21,989	
	2002	$ 46,080	$ 21,127	$ 25,898	
	2003	$ 47,058	$ 20,709	$ 28,728	
	2004	$ 47,924	$ 21,617	$ 33,673	

Source: Bureau of Labor Statistics. December 2005. Quarterly Census of Employment and Wages. Personal Communication. http://www.bls.gov/data/

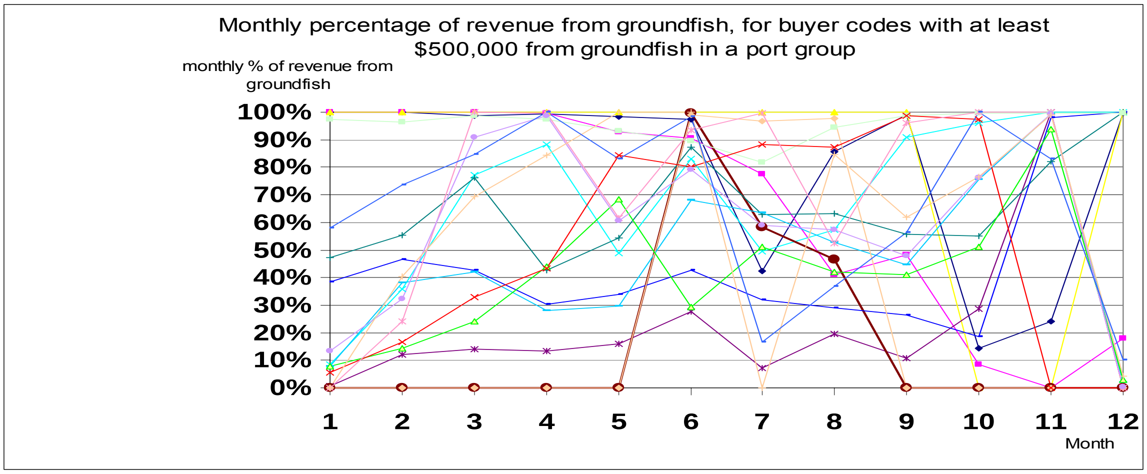


Figure 7-3. Seasonality of Groundfish Purchases by Major Buyers.

Table 7-46. Ex-vessel and Fuel Price Trends.

	Inflation Adjusted Ex-vessel, Fuel Prices, and Revenues per Bottom Trawl Hour						
	Whiting	Flatfish	Sablefish	Rockfish	Total Groundfish	Revenue/hour	Fuel
	$/lb	$/lb	$/lb	$/lb	$/lb	$/hr	$/gallon
1999	$0.04	$0.36	$1.36	$0.66	$0.64	$264.25	$0.93
2000	$0.05	$0.44	$1.66	$0.76	$0.78	$285.99	$1.17
2001	$0.04	$0.47	$1.59	$0.84	$0.80	$260.69	$1.21
2002	$0.05	$0.45	$1.55	$0.93	$0.75	$249.48	$0.97
2003	$0.05	$0.46	$1.66	$0.91	$0.80	$311.24	$1.12
2004	$0.04	$0.44	$1.37	$0.96	$0.73	$351.13	$1.70
2005	$0.05	$0.42	$1.45	$0.87	$0.74	$345.3[e/]	$2.20

		Change in Prices Relative to 1999				Bottom Trawl	
	Whiting	Flatfish	Sablefish	Rockfish	Total Groundfish	Revenue/hour	Fuel
1999	100%	100%	100%	100%	100%	100%	100%
2000	125%	122%	122%	115%	122%	108%	126%
2001	100%	131%	117%	127%	125%	99%	130%
2002	125%	125%	114%	141%	117%	94%	104%
2003	125%	128%	122%	138%	125%	118%	120%
2004	100%	122%	101%	145%	114%	133%	182%
2005	125%	117%	107%	132%	116%		236%

Ex-vessel Prices PacFIN
Fuel Prices-June Marine Fuel Prices, Newport as collected by PSMFC
Bottom Trawl Revenue/Hour Fished, NMFS NWR-Burden (12/2005)
All prices deflated to 2005
[e/]: preliminary estimate (logbook data not complete)

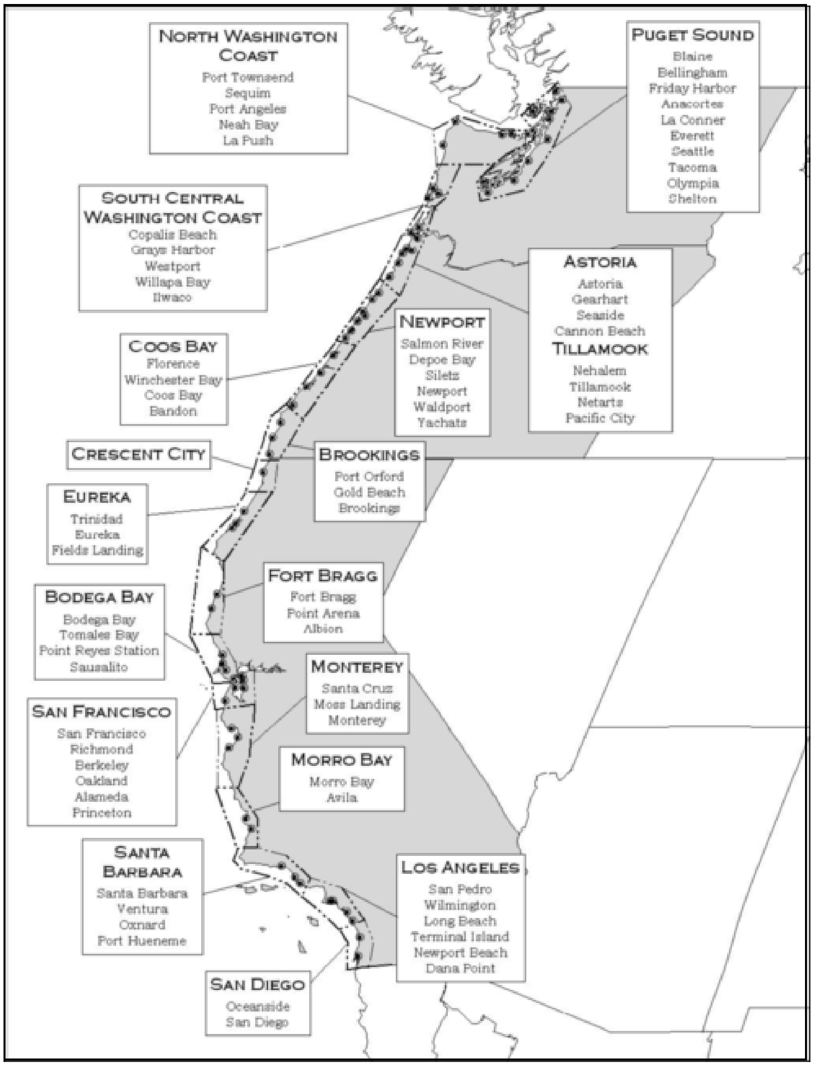


Figure 7-4. West Coast Fishing Communities.

Table 7-47. Port Group County Community Relationships.

Port Group Area	County	Name
Washington		
Puget Sound	Whatcom	Blaine
	Whatcom	Bellingham Bay
	San Juan	Friday Harbor
	Skagit	Anacortes
	Skagit	La Conner
	Snohomish	Other North Puget Sound Ports
	Snohomish	Everett
	King	Seattle
	Pierce	Tacoma
	Thurston	Olympia
	Mason	Shelton
	Unknown	Other South Puget Sound Ports
North Washington Coast	Jefferson	Port Townsend
	Clallam	Sequim
	Clallam	Port Angeles
	Clallam	Neah Bay
	Clallam	La Push
South & Central WA Coast	Grays Harbor	Copalis Beach
	Grays Harbor	Grays Harbor
	Grays Harbor	Westport
	Pacific	Willapa Bay
	Pacific	Ilwaco/Chinook
	Klickitat	Other Columbia River Ports
Unidentified WA	Pacific	Other Washington Coastal Ports
	Unknown	Unknown WA Ports

Port Group Area	County	Name
California		
Crescent City	Del Norte	Crescent City
	Del Norte	Other Del Norte County Ports
Eureka	Humboldt	Eureka (Includes Fields Landing)
	Humboldt	Fields Landing
	Humboldt	Trinidad
	Humboldt	Other Humboldt County Ports
Fort Bragg	Mendocino	Fort Bragg
	Mendocino	Albion
	Mendocino	Arena
	Mendocino	Other Mendocino County Ports
Bodega Bay	Sonoma	Bodega Bay
	Marin	Tomales Bay
	Marin	Point Reyes
	Marin	Other Son. and Mar. Co. Outer Coast Ports
	Marin	Sausalito
San Francisco	Alameda	Oakland
	Alameda	Alameda
	Alameda	Berkely
	Contra Costa	Richmond
	San Francisco	San Francisco
	San Mateo	Princeton
	San Francisco	San Francisco Area
	San Francisco	Other S.F. Bay and S.M. Co. Ports

Port Group Area	County	Name	Port Group Area	County	Name
Oregon			**California**		
Astoria	Multnomah	Pseudo Port Code for Columbia R.	Monterey	Santa Cruz	Santa Cruz
	Clatsop	Astoria		Monterey	Moss Landing
	Clatsop	Gearhart - Seaside		Monterey	Monterey
	Clatsop	Cannon Beach		Monterey	Other S.C. and Mon. Co. Ports
	Unknown	Landed in WA; Transp. to OR	Morro Bay	San Luis Obispo	Morro Bay
Tillamook	Tillamook	Nehalem Bay		San Luis Obispo	Avila
	Tillamook	Tillamook / Garibaldi		San Luis Obispo	Other S.L..O. Co. Ports
	Tillamook	Netarts Bay	Santa Barbara	Santa Barbara	Santa Barbara
	Tillamook	Pacific City		Santa Barbara	Santa Barbara Area
Newport	Lincoln	Salmon River		Ventura	Port Hueneme
	Lincoln	Siletz Bay		Ventura	Oxnard
	Lincoln	Depoe Bay		Ventura	Ventura
	Lincoln	Newport		Ventura	Other S.B. and Ven. Co. Ports
	Lincoln	Waldport	Los Angeles	Los Angeles	Terminal Island
	Lincoln	Yachats		Los Angeles	San Pedro Area
Coos Bay	Lane	Florence		Los Angeles	San Pedro
	Douglas	Winchester Bay		Los Angeles	Willmington
	Coos	Coos Bay		Los Angeles	Longbeach
	Coos	Bandon		Orange	Newport Beach
Brookings	Curry	Port Orford		Orange	Dana Point
	Curry	Gold Beach		Orange	Other LA and Orange Co. Ports
	Curry	Brookings	San Diego	San Diego	San Diego
				San Diego	Oceanside
				San Diego	San Diego Area
				San Diego	Other S.D. Co. Ports
			Unidentified CA	Unknown	Unknown CA Ports

California Recreational Groupings

North Coast: Humboldt and Del Norte Counties

North-Central: Sonoma,Mendocino , San Mateo to Marin

South-Central Coast: San Luis Obispo through Santa Cruz

South Coast: Ventura to San Diego Counties

Table 7-48. Environmental Justice—Communities of Concern.

Name	Qualifying Demographic Criteria
Blaine, Washington	poverty rate
La Conner, Washington	% Hispanic
Neah Bay, Washington	% nonwhite, % Native American, average income, poverty rate
La Push, Washington	% nonwhite, % Native American, poverty rate
Copalis Beach, Washington	income
Westport, Washington	income, poverty rate
Willapa Bay	income, poverty rate
Salmon River, Oregon	% Native American
Siletz Bay, Oregon	% Native American
Waldport, Oregon	income
Winchester Bay, Oregon	income, poverty rate
Port Orford, Oregon	income, poverty rate
Brookings, Oregon	% Native American, income
Trinidad, California	% Native American, income, poverty rate
Fort Bragg, California	% Hispanic
Albion, California	% Hispanic
Point Arena, California	% Native American, % Hispanic
Moss Landing, California	% Native American, % Hispanic

Table 7-49. Optimum Yields for Rebuilding Species and Representative Target Species by Alternative.

	2005 & 2006 OY		OY by Preliminary Preferred Alternative			Change from2006 OY			%change from 2006 OY		
SPECIES	2005	2006	Action I	Action 2	Action 3	Action I	Action 2	Action 3	Action I	Action 2	Action 3
OVERFISHED SPECIES											
PACIFIC OCEAN PERCH	447	447	44	100	100	-403	-347	-347	-90%	-78%	-78%
WIDOW ROCKFISH	285	289	120	368	368	-169	79	79	-58%	27%	27%
CANARY ROCKFISH	47	47	32	44	44	-15	-3	-3	-32%	-6%	-6%
BOCACCIO	307	309	40	218	218	-269	-91	-91	-87%	-29%	-29%
COWCOD	4.2	4.2	4	8	8	-0.2	3.8	3.8	-5%	90%	90%
DARK-BLOTCHED	269	200	130	229	229	-70	29	29	-35%	15%	15%
YELLOWEYE	26	27	12.6	23	23	-14.4	-4	-4	-53%	-15%	-15%
TARGET SPECIES											
PACIFIC WHITING (US)	269,069	269,069	150,000	220,000	260,000	-119,069	-49,069	-9,069	-44%	-18%	-3%
LINGCOD - coastwide	2,414	2,414	6,280	6,280	6,280	3,866	3,866	3,866	160%	160%	160%
SABLEFISH (coastwide)	7,761	7,634	5,934	5,934	5,934	-1,700	-1,700	-1,700	-22%	-22%	-22%
YELLOWTAIL ROCKFISH	3,896	3,681	4,548	4,548	4,548	867	867	867	24%	24%	24%
SHORTSPINE THD	999	1,018	2,055	2,055	2,055	1,037	1,037	1,037	102%	102%	102%
NEARSHORE SPECIES	122	122	142	142	142	20	20	20	16%	16%	16%
DOVER SOLE	7,476	7,564	16,500	16,500	16,500	8,936	8,936	8,936	118%	118%	118%
ENGLISH SOLE	3,100	3,100	6,237	6,237	6,237	3,137	3,137	3,137	101%	101%	101%
PETRALE SOLE (coastwide)	2,762	2,762	2,499	2,499	2,499	-263	-263	-263	-10%	-10%	-10%
STARRY FLOUNDER	1,221	1,395	890	890	890	-505	-505	-505	-36%	-36%	-36%

Table 7-50. Coastwide Exvessel Revenue by Directed Non-Tribal Groundfish Sector and Alternative (thousands of USD).

Sector	2005 Rev	Action 1	Action 2	Action 3	Reb Alt 1	Reb Alt 2	Reb Alt 3	Reb Alt 4	Reb Alt 5
Nearshore Groundfish	2,847	2,257	2,791	2,847	2,295	2,791	2,847	2,295	2,295
LE Bottom Trawl	21,969	12,982	22,868	23,145	24,165	23,491	27,660	25,288	13,758
LE Whiting	29,562	17,293	23,135	30,146	17,293	30,146	30,146	17,293	17,293
FG Sablefish N CP	14,387	8,723	8,723	8,723	8,723	8,723	8,723	8,723	8,723
FG South 34 27	2,137	1,517	2,137	2,137	2,137	2,137	2,137	2,137	1,517
Total	68,765	42,772	59,654	64,861	52,476	65,151	69,376	53,599	42,069
% of Status Quo	100%	62%	87%	94%	76%	95%	101%	78%	61%

Table7-51 Coastwide Recreational Effort Estimates by Target and Alternative

		Action Alternatives			Rebuilding Alternatives				
Target	2005	Action 1	Action 2	Action 3	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Grdfish	507,570	325,127	395,025	556,893	418,408	504,200	519,956	414,950	322,675
Halibut	31,359	25,563	26,246	30,980	32,254	30,980	32,254	26,246	25,563
Total Bottom fish	538,929	350,690	421,271	587,873	450,662	535,180	552,210	441,196	348,238
Grdfish	% of 2005	64%	78%	110%	82%	99%	102%	82%	64%
Halibut		82%	84%	99%	103%	99%	103%	84%	82%
Total Bottom fish	% of 2005	65%	78%	109%	84%	99%	102%	82%	65%

Table 7-52 LE Bottom Trawl Exvessel Revenue by Region and Period under Action Alternative 1

	Two Month Period						
Region	1	2	3	4	5	6	Total
N WA	186,926	141,610	280,051	371,155	165,609	173,610	1,318,961
S WA / N OR	923,242	719,192	847,808	840,507	764,800	763,553	4,859,101
S OR / N CA	716,436	439,000	559,494	668,514	648,570	796,771	3,828,784
OTHER CAL	285,045	335,361	577,726	640,449	522,079	534,977	2,895,636
UNKN	11,383	16,251	19,195	11,748	13,553	7,362	79,490
Total	2,123,031	1,651,413	2,284,274	2,532,372	2,114,611	2,276,272	12,981,972

Table 7-53 LE Whiting Trawl Exvessel Revenue by Region and Period under Action Alternative 1

		Two Month Period						
Sector	Region	1	2	3	4	5	6	Total
At-Sea	N WA			2,627,167	5,652,569	55,976		8,335,712
Shore-based	N WA	-	-	3,154	9,942	3,147	-	16,243
	S WA / N OR	-	79,368	1,501,769	3,271,655	27,652	-	4,880,443
	S OR / N CA	1,375	54,112	289,329	578,886	7,431	-	931,133
	C AND S CAL	-	-	-	-	-	-	-
	OTHER	-	-	-	-	-	-	-
	Total	1,375	133,481	4,421,418	9,513,051	94,206	-	14,163,532

Table 7-54 Nearshore Groundfish Exvessel Revenue by Region under Action Alternative 1

Region	2005 Revenue	Exvessel Revenue
North of 40 10 latitude	1,379,012	797,058
South of 40 10 latitude	1,327,490	1,460,764
Total	2,706,502	2,257,822

Table 7-55 LE Bottom Trawl Exvessel Revenue by Region and Period under Action Alternative 2

	Two Month Period						
REGION	1	2	3	4	5	6	Total
N WA	312,015	258,993	411,390	557,333	271,916	248,962	2,060,608
S WA / N OR	1,543,505	1,362,544	1,613,443	1,510,891	1,373,308	1,130,079	8,533,769
S OR / N CA	1,137,883	947,487	1,191,618	1,357,948	1,322,423	1,116,958	7,074,318
OTHER CAL	400,163	540,126	1,122,040	1,253,585	992,839	735,142	5,043,895
UNKN	18,007	24,488	53,113	27,074	21,469	10,875	155,026
Total	3,411,571	3,133,638	4,391,603	4,706,831	3,981,956	3,242,017	22,867,616

Table 7-58 LE Whiting Trawl Exvessel Revenue by Region and Period under Action Alternative 2

		Two Month Period						
Sector	Region	1	2	3	4	5	6	Total
At Sea	N WA			3,614,319	11,457,946	65,099		11,554,788
Shore-based	N WA	-	-	4,377	13,798	4,367	-	22,542
	N OR	-	110,146	2,084,141	4,540,372	38,375	-	6,773,034
	S OR N CAL	1,909	75,097	401,528	803,372	10,312	-	1,292,217
	OTHER CAL	-	-	-	-	-	-	-
	UNKN	-	-	-	-	-	-	-
	Total	1,909	185,243	6,104,365	16,815,488	118,154	-	19,642,582

Table 7-59 Nearshore Groundfish Exvessel Revenue by Region under Action Alternative 2

Region	2005 Revenue	Exvessel Revenue
North of 40 10	1,379,012	1,072,911
South of 40 10	1,327,490	1,718,545
Total	2,706,502	2,791,457

Table 7-60 LE Bottom Trawl Exvessel Revenue by Region and Period under Action Alternative 3

	Two Month Period						
Region	1	2	3	4	5	6	Total
N WA	312,015	260,130	433,394	583,330	271,916	248,962	2,109,747
S WA / N OR	1,543,505	1,362,544	1,698,945	1,571,126	1,373,419	1,130,079	8,679,618
S OR / N CA	1,137,883	947,487	1,231,536	1,392,844	1,322,423	1,116,958	7,149,132
OTHER CA	400,163	540,126	1,122,110	1,253,694	992,839	735,142	5,044,074
UNKN	18,007	24,488	56,072	31,563	21,469	10,875	162,474
Total	3,411,571	3,134,775	4,542,057	4,832,557	3,982,067	3,242,017	23,145,044

Table 7-61 LE Whiting Trawl Exvessel Revenue by Region and Period under Action Alternative 3

Sector	Region	1	2	3	4	5	6	Total
At Sea	N WA			2,934,442	11,479,234	2,452,763		15,112,714
Shore-based	N WA	-	-	6,752	21,283	6,737	-	34,771
	S WA / N OR	-	169,903	3,214,833	7,003,624	59,194	-	10,447,554
	S OR / N CA	2,944	115,838	619,366	1,239,219	15,907	-	1,993,274
	OTHER CA	-	-	-	-	-	-	-
	UNKN	-	-	-	-	-	-	-
	Total	2,944	285,741	6,775,392	19,743,359	2,534,601	-	27,588,313

Table 7-62a. Ex-vessel revenue projections by major sector

Ex-vessel Revenue (million $)	2005	No Action	Alternative 1	Alternative 2	Alternative 3	Council Preferred Alternative
Total West Coast Exvessel Revenue (including at-sea and tribal)	279.4	279.5	254.4	270.2	277.4	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)	64.4	64.2	40.6	56.1	62.5	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)	47.5	47.2	27.2	42.4	48.5	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting	33.5	32.5	19.4	31.5	34.3	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting	22.2	21.1	13.4	23.2	23.4	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)	25.2	26.1	13.8	19.2	25.1	
LE Fixed Gear Groundfish Exvessel Revenue	10.7	10.7	8.2	8.4	8.4	
Open Access Groundfish Exvessel Revenue	6.3	6.3	5.1	5.4	5.6	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)	4.8	5.2	4.5	4.5	4.8	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)	2.6	2.6	1.8	2.0	2.6	
Change compared to No Action (million $)						
Total West Coast Exvessel Revenue (including at-sea and tribal)			- 25.1	- 9.3	- 2.1	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)			- 23.7	- 8.1	- 1.7	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)			- 20.0	- 4.8	+ 1.3	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting			- 13.1	- 0.9	+ 1.9	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting			- 7.7	+ 2.1	+ 2.3	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)			- 12.3	- 6.9	- 1.0	
LE Fixed Gear Groundfish Exvessel Revenue			- 2.5	- 2.3	- 2.3	
Open Access Groundfish Exvessel Revenue			- 1.2	- 1.0	- 0.8	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)			- 0.7	- 0.7	- 0.4	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)			- 0.7	- 0.5	+ 0.0	
Change compared to No Action (%)						
Total West Coast Exvessel Revenue (including at-sea and tribal)			-9.0%	-3.3%	-0.8%	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)			-36.9%	-12.6%	-2.7%	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)			-42.4%	-10.3%	+2.7%	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting			-40.3%	-2.9%	+5.8%	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting			-36.6%	+9.9%	+11.0%	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)			-47.0%	-26.5%	-3.9%	
LE Fixed Gear Groundfish Exvessel Revenue			-23.3%	-21.3%	-21.2%	
Open Access Groundfish Exvessel Revenue			-18.7%	-15.3%	-12.0%	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)			-14.2%	-12.5%	-7.5%	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)			-28.3%	-21.2%	+0.0%	

Table 7-62b. Commercial harvest projection by major sector.

Landings and Deliveries (thousand mt)	2005	No Action	Alternative 1	Alternative 2	Alternative 3	Council Preferred Alternative
Total West Coast Landings (includes at-sea and tribal)	503.0	510.0	382.8	443.3	503.5	
Non-Tribal Groundfish Landings and Deliveries (includes at-sea)	247.9	254.9	137.4	195.4	248.2	
Total LE Trawl Groundfish Landings and Deliveries (includes at-sea)	243.4	250.4	133.8	191.7	244.5	
Shoreside LE Trawl Groundfish Landings Including Whiting	115.6	115.3	62.0	92.4	114.7	
Shoreside LE Trawl Groundfish Landings Excluding Whiting	19.3	18.4	10.9	21.3	21.6	
LE Trawl Whiting Landings and Deliveries (shoreside and at-sea)	224.2	232.0	122.9	170.4	222.9	
LE Fixed Gear Groundfish Landings	2.8	2.9	2.3	2.3	2.3	
Open Access Groundfish Landings	1.6	1.6	1.3	1.4	1.4	
Tribal Groundfish Shoreside Landings (including whiting)	13.7	13.9	10.8	11.6	14.1	
Tribal Groundfish At-Sea Deliveries (whiting)	23.6	23.3	16.7	18.4	23.3	
Change compared to No Action (thousand mt)						
Total West Coast Landings (includes at-sea and tribal)			- 127.1	- 66.7	- 6.5	
Non-Tribal Groundfish Landings and Deliveries (includes at-sea)			- 117.5	- 59.5	- 6.7	
Total LE Trawl Groundfish Landings and Deliveries (includes at-sea)			- 116.6	- 58.7	- 5.9	
Shoreside LE Trawl Groundfish Landings Including Whiting			- 53.3	- 23.0	- 0.6	
Shoreside LE Trawl Groundfish Landings Excluding Whiting			- 7.5	+ 2.9	+ 3.2	
LE Trawl Whiting Landings and Deliveries (shoreside and at-sea)			- 109.0	- 61.5	- 9.1	
LE Fixed Gear Groundfish Landings			- 0.6	- 0.6	- 0.6	
Open Access Groundfish Landings			- 0.3	- 0.3	- 0.2	
Tribal Groundfish Shoreside Landings (including whiting)			- 3.1	- 2.3	+ 0.2	
Tribal Groundfish At-Sea Deliveries (whiting)			- 6.6	- 5.0	+ 0.0	
Change compared to No Action (%)						
Total West Coast Landings (includes at-sea and tribal)			-24.9%	-13.1%	-1.3%	
Non-Tribal Groundfish Landings and Deliveries (includes at-sea)			-46.1%	-23.3%	-2.6%	
Total LE Trawl Groundfish Landings and Deliveries (includes at-sea)			-46.5%	-23.4%	-2.4%	
Shoreside LE Trawl Groundfish Landings Including Whiting			-46.2%	-19.9%	-0.5%	
Shoreside LE Trawl Groundfish Landings Excluding Whiting			-40.9%	15.6%	17.2%	
LE Trawl Whiting Landings and Deliveries (shoreside and at-sea)			-47.0%	-26.5%	-3.9%	
LE Fixed Gear Groundfish Landings			-21.1%	-19.8%	-19.5%	
Open Access Groundfish Landings			-18.8%	-16.7%	-14.6%	
Tribal Groundfish Shoreside Landings (including whiting)			-22.1%	-16.2%	1.6%	
Tribal Groundfish At-Sea Deliveries (whiting)			-28.3%	-21.2%	0.0%	

Table 7-62c. Commercial income impact by major sector.

Income Impacts (million $)	2005	No Action	Alternative 1	Alternative 2	Alternative 3	Council Preferred Alternative
Total West Coast Income Impacts (including at sea and tribal)	624.1	625.2	567.0	602.0	621.8	
Non-Tribal Groundfish Income Impacts (including at-sea)	139.4	140.0	83.8	118.4	136.9	
Total LE Trawl Groundfish Income Impacts (including at sea)	115.0	115.5	64.6	98.6	116.7	
Shoreside LE Trawl Groundfish Income Impacts Including Whiting	81.4	79.9	45.8	72.5	82.6	
Shoreside LE Trawl Groundfish Income Impacts Excluding whiting	38.9	37.2	23.1	41.1	41.5	
LE Trawl Whiting Income Impacts (shoreside and at-sea)	76.1	78.3	41.5	57.5	75.2	
LE Fixed Gear Groundfish Income Impacts	15.3	15.4	11.9	12.2	12.2	
Open Access Groundfish Income Impacts	9.1	9.1	7.3	7.6	7.9	
Tribal Groundfish Shoreside Income Impacts (including whiting)	11.8	12.3	10.2	10.7	12.0	
Tribal Groundfish At-Sea Income Impacts (whiting)	8.0	7.9	5.6	6.2	7.9	
Change compared to No Action (million $)						
Total West Coast Income Impacts (including at sea and tribal)			- 58.2	- 23.3	- 3.4	
Non-Tribal Groundfish Income Impacts (including at-sea)			- 56.1	- 21.6	- 3.1	
Total LE Trawl Groundfish Income Impacts (including at sea)			- 50.9	- 16.9	+ 1.3	
Shoreside LE Trawl Groundfish Income Impacts Including Whiting			- 34.2	- 7.5	+ 2.6	
Shoreside LE Trawl Groundfish Income Impacts Excluding whiting			- 14.1	+ 3.9	+ 4.3	
LE Trawl Whiting Income Impacts (shoreside and at-sea)			- 36.8	- 20.8	- 3.1	
LE Fixed Gear Groundfish Income Impacts			- 3.5	- 3.2	- 3.2	
Open Access Groundfish Income Impacts			- 1.7	- 1.4	- 1.1	
Tribal Groundfish Shoreside Income Impacts (including whiting)			- 2.1	- 1.7	- 0.3	
Tribal Groundfish At-Sea Income Impacts (whiting)			- 2.2	- 1.7	- 0.0	
Change compared to No Action (%)						
Total West Coast Income Impacts (including at sea and tribal)			-9.3%	-3.7%	-0.5%	
Non-Tribal Groundfish Income Impacts (including at-sea)			-40.1%	-15.4%	-2.2%	
Total LE Trawl Groundfish Income Impacts (including at sea)			-44.0%	-14.6%	+1.1%	
Shoreside LE Trawl Groundfish Income Impacts Including Whiting			-42.7%	-9.4%	+3.3%	
Shoreside LE Trawl Groundfish Income Impacts Excluding whiting			-37.8%	+10.4%	+11.6%	
LE Trawl Whiting Income Impacts (shoreside and at-sea)			-47.0%	-26.5%	-3.9%	
LE Fixed Gear Groundfish Income Impacts			-23.0%	-21.0%	-20.9%	
Open Access Groundfish Income Impacts			-19.0%	-15.7%	-12.5%	
Tribal Groundfish Shoreside Income Impacts (including whiting)			-17.2%	-13.6%	-2.7%	
Tribal Groundfish At-Sea Income Impacts (whiting)			-28.3%	-21.2%	-0.0%	

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-63a. Ex-vessel revenue projections by State, port area, and major sector. (Page 1 of 2)

	WASHINGTON					OREGON				
Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WA TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OR TOTAL
2005										
Shoreside LE Trawl	2.19	0.50	4.26	-	6.95	8.61	6.90	3.05	0.85	19.41
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.02	0.61	1.12	-	3.76	0.84	1.54	1.22	0.58	4.18
Open Access	0.02	0.12	0.53	-	0.67	0.29	0.07	0.34	1.21	1.90
Tribal Groundfish	0.24	2.73	1.28	0.60	4.84	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.91	9.09	50.84	7.15	75.98	31.68	24.17	18.73	10.13	84.71
No Action (2006)										
Shoreside LE Trawl	1.87	0.45	4.23	-	6.56	8.28	6.88	2.95	0.83	18.94
At Sea Whiting	-		-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.04	0.61	1.13	-	3.78	0.85	1.55	1.23	0.58	4.21
Open Access	0.02	0.12	0.53	-	0.67	0.29	0.07	0.35	1.20	1.90
Tribal Groundfish	0.25	3.05	1.27	0.62	5.19	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.63	9.37	50.81	7.16	75.97	31.35	24.16	18.64	10.12	84.27
Alternative 1										
Shoreside LE Trawl	1.25	0.30	2.29	-	3.83	4.97	3.85	1.80	0.51	11.12
At Sea Whiting	-		-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	1.56	0.46	0.85	-	2.87	0.64	1.16	0.92	0.45	3.17
Open Access	0.02	0.09	0.40	-	0.51	0.24	0.06	0.27	0.98	1.54
Tribal Groundfish	0.24	2.77	0.97	0.48	4.45	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	7.50	8.74	48.15	7.03	71.43	27.78	20.73	17.11	9.43	75.06
Alternative 2										
Shoreside LE Trawl	1.98	0.44	3.26	-	5.68	8.35	5.76	3.15	0.94	18.21
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	1.56	0.46	0.85	-	2.88	0.64	1.16	0.92	0.45	3.18
Open Access	0.02	0.09	0.40	-	0.51	0.24	0.06	0.27	1.03	1.59
Tribal Groundfish	0.24	2.77	1.05	0.48	4.54	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.24	8.89	49.21	7.03	73.37	31.17	22.64	18.47	9.92	82.19
Alternative 3										
Shoreside LE Trawl	2.00	0.45	4.14	-	6.60	8.89	6.85	3.27	0.95	19.96
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	1.56	0.46	0.85	-	2.88	0.64	1.16	0.92	0.45	3.18
Open Access	0.02	0.09	0.40	-	0.51	0.24	0.06	0.27	1.08	1.64
Tribal Groundfish	0.24	2.77	1.32	0.48	4.80	-	-	-	-	0.00
Tribal Non-Groundfish	0.71	3.00	0.23	6.53	10.47	-	-	-	-	0.00
Non Groundfish	3.73	2.13	43.42	0.01	49.29	21.94	15.66	14.12	7.49	59.22
TOTAL	8.27	8.90	50.36	7.03	74.56	31.71	23.74	18.58	9.98	84.00

Table 7-63a. Ex-vessel revenue projections by State, port area, and major sector. (Page 2 of 2)

	CALIFORNIA									
Alternative / Fishery	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CA TOTAL
2005										
Shoreside LE Trawl	0.73	2.55	1.78	0.80	0.79	0.50	-	-	-	7.15
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.22	0.31	0.24	0.20	0.42	-	0.26	0.74	0.32	2.72
Open Access	0.37	0.25	0.97	0.26	0.53	0.95	0.14	0.09	0.18	3.74
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.22	5.55	5.28	19.54	8.28	2.93	22.68	28.49	5.11	102.08
No Action (2006)										
Shoreside LE Trawl	0.70	2.43	1.83	0.71	0.83	0.47	-	-	-	6.96
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.22	0.31	0.24	0.20	0.42	-	0.26	0.74	0.32	2.72
Open Access	0.37	0.25	0.98	0.26	0.53	0.95	0.14	0.09	0.18	3.75
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.20	5.44	5.33	19.44	8.32	2.90	22.68	28.49	5.10	101.90
Alternative 1										
Shoreside LE Trawl	0.42	1.55	1.11	0.47	0.58	0.31	-	-	-	4.43
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.18	0.24	0.18	0.16	0.35	-	0.21	0.59	0.25	2.18
Open Access	0.33	0.20	0.76	0.22	0.44	0.78	0.13	0.09	0.15	3.09
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	3.84	4.42	4.34	19.13	7.91	2.57	22.61	28.34	5.01	98.17
Alternative 2										
Shoreside LE Trawl	0.78	2.60	2.12	0.74	0.91	0.50	-	-	-	7.64
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.18	0.24	0.18	0.16	0.35	-	0.24	0.71	0.30	2.38
Open Access	0.35	0.20	0.78	0.24	0.45	0.86	0.14	0.09	0.16	3.26
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.21	5.47	5.37	19.41	8.26	2.85	22.66	28.46	5.06	101.73
Alternative 3										
Shoreside LE Trawl	0.78	2.69	2.14	0.75	0.91	0.51	-	-	-	7.77
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.18	0.24	0.18	0.17	0.35	-	0.24	0.71	0.30	2.38
Open Access	0.37	0.20	0.80	0.25	0.46	0.95	0.14	0.09	0.16	3.42
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	2.91	2.44	2.29	18.27	6.55	1.48	22.27	27.66	4.60	88.47
TOTAL	4.24	5.56	5.40	19.43	8.27	2.94	22.66	28.46	5.06	102.03

Table 7-63b. Change in ex-vessel revenue projections by State, port area, and major sector. (Page 1 of 2)

	WASHINGTON					OREGON				
Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WA TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OR TOTAL
No Action (2006)										
Shoreside LE Trawl	*1.87*	*0.45*	*4.23*	*-*	*6.56*	*8.28*	*6.88*	*2.95*	*0.83*	*18.94*
At Sea Whiting	*-*	*-*	*-*	*-*	*0.00*	*-*	*-*	*-*	*-*	*0.00*
LE Fixed Gear	*2.04*	*0.61*	*1.13*	*-*	*3.78*	*0.85*	*1.55*	*1.23*	*0.58*	*4.21*
Open Access	*0.02*	*0.12*	*0.53*	*-*	*0.67*	*0.29*	*0.07*	*0.35*	*1.20*	*1.90*
Tribal Groundfish	*0.25*	*3.05*	*1.27*	*0.62*	*5.19*	*-*	*-*	*-*	*-*	*0.00*
Tribal Non-Groundfish	*0.71*	*3.00*	*0.23*	*6.53*	*10.47*	*-*	*-*	*-*	*-*	*0.00*
Non Groundfish	*3.73*	*2.13*	*43.42*	*0.01*	*49.29*	*21.94*	*15.66*	*14.12*	*7.49*	*59.22*
TOTAL	*8.63*	*9.37*	*50.81*	*7.16*	*75.97*	*31.35*	*24.16*	*18.64*	*10.12*	*84.27*
Alternative 1										
Shoreside LE Trawl	-0.63	-0.15	-1.95	-	-2.73	-3.31	-3.03	-1.15	-0.32	-7.82
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.48	-0.15	-0.28	-	-0.91	-0.21	-0.39	-0.31	-0.14	-1.04
Open Access	0.00	-0.03	-0.13	-	-0.17	-0.05	-0.01	-0.08	-0.22	-0.36
Tribal Groundfish	-0.02	-0.29	-0.30	-0.14	-0.74	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-1.13	-0.62	-2.66	-0.14	-4.54	-3.57	-3.43	-1.53	-0.68	-9.21
Alternative 2										
Shoreside LE Trawl	0.11	-0.01	-0.98	-	-0.88	+0.07	-1.12	+0.21	+0.11	-0.73
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.47	-0.15	-0.28	-	-0.90	-0.21	-0.39	-0.31	-0.14	-1.04
Open Access	0.00	-0.03	-0.13	-	-0.16	-0.05	-0.01	-0.08	-0.17	-0.31
Tribal Groundfish	-0.02	-0.29	-0.21	-0.14	-0.65	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.39	-0.47	-1.60	-0.14	-2.60	-0.19	-1.52	-0.17	-0.20	-2.08
Alternative 3										
Shoreside LE Trawl	0.13	+0.00	-0.10	-	+0.04	+0.61	-0.03	+0.32	+0.11	+1.02
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.47	-0.15	-0.28	-	-0.90	-0.21	-0.38	-0.31	-0.13	-1.03
Open Access	0.00	-0.03	-0.13	-	-0.16	-0.05	-0.01	-0.08	-0.12	-0.26
Tribal Groundfish	-0.02	-0.29	+0.05	-0.14	-0.39	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.36	-0.46	-0.45	-0.14	-1.41	+0.35	-0.42	-0.06	-0.14	-0.27

Table 7-63b. Change in ex-vessel revenue projections by State, port area, and major sector. (Page 2 of 2)

	CALIFORNIA									
Alternative / Fishery	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CA TOTAL
No Action (2006)										
Shoreside LE Trawl	*0.70*	*2.43*	*1.83*	*0.71*	*0.83*	*0.47*	-	-	-	*6.96*
At Sea Whiting	-	-	-	-	-	-	-	-	-	*0.00*
LE Fixed Gear	*0.22*	*0.31*	*0.24*	*0.20*	*0.42*	-	*0.26*	*0.74*	*0.32*	*2.72*
Open Access	*0.37*	*0.25*	*0.98*	*0.26*	*0.53*	*0.95*	*0.14*	*0.09*	*0.18*	*3.75*
Tribal Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Non Groundfish	*2.91*	*2.44*	*2.29*	*18.27*	*6.55*	*1.48*	*22.27*	*27.66*	*4.60*	*88.47*
TOTAL	*4.20*	*5.44*	*5.33*	*19.44*	*8.32*	*2.90*	*22.68*	*28.49*	*5.10*	*101.90*
Alternative 1										
Shoreside LE Trawl	-0.27	-0.89	-0.72	-0.24	-0.25	-0.16	-	-	-	-2.52
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.05	-0.08	-0.06	-0.04	-0.07	-	-0.05	-0.14	-0.07	-0.55
Open Access	-0.03	-0.05	-0.22	-0.04	-0.09	-0.17	-0.02	-0.00	-0.03	-0.66
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.35	-1.02	-1.00	-0.31	-0.41	-0.33	-0.07	-0.15	-0.10	-3.73
Alternative 2										
Shoreside LE Trawl	+0.08	+0.16	+0.29	+0.03	+0.08	+0.03	-	-	-	+0.68
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.04	-0.08	-0.06	-0.04	-0.07	-	-0.02	-0.03	-0.02	-0.35
Open Access	-0.02	-0.05	-0.20	-0.02	-0.08	-0.09	-0.01	-0.00	-0.03	-0.50
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	+0.02	+0.03	+0.03	-0.03	-0.06	-0.05	-0.02	-0.03	-0.04	-0.16
Alternative 3										
Shoreside LE Trawl	+0.09	+0.25	+0.31	+0.04	+0.08	+0.04	-	-	-	+0.81
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.04	-0.07	-0.06	-0.04	-0.07	-	-0.02	-0.03	-0.02	-0.34
Open Access	-0.00	-0.05	-0.18	-0.01	-0.06	-0.00	-0.00	-0.00	-0.03	-0.34
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	+0.04	+0.13	+0.07	-0.01	-0.04	+0.04	-0.02	-0.03	-0.04	+0.14

Table 7-64a. Estimated income impact projections by State, port area, and major sector. (Page 1 of 2)

	WASHINGTON					OREGON				
Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WA TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OR TOTAL
2005										
Shoreside LE Trawl	4.14	0.89	18.72	-	23.76	17.86	18.49	5.77	1.37	43.48
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	3.21	0.86	1.62	-	5.70	1.09	2.06	1.63	0.77	5.55
Open Access	0.04	0.18	0.78	-	1.00	0.37	0.09	0.49	1.50	2.46
Tribal Groundfish	0.39	4.26	6.45	0.71	11.81	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	15.88	13.80	108.95	9.46	148.09	95.14	44.40	30.32	15.89	185.75
No Action (2006)										
Shoreside LE Trawl	3.61	0.81	18.77	-	23.19	17.32	18.52	5.62	1.35	42.82
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	3.23	0.87	1.64	-	5.74	1.09	2.08	1.64	0.77	5.59
Open Access	0.04	0.18	0.79	-	1.01	0.37	0.09	0.49	1.50	2.45
Tribal Groundfish	0.42	4.80	6.38	0.74	12.34	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	15.40	14.26	108.94	9.49	148.10	94.62	44.45	30.19	15.87	185.12
Alternative 1										
Shoreside LE Trawl	2.29	0.50	10.03	-	12.83	9.93	10.10	3.36	0.83	24.22
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.52	0.66	1.23	-	4.40	0.82	1.56	1.23	0.59	4.21
Open Access	0.03	0.14	0.59	-	0.75	0.31	0.08	0.38	1.22	1.99
Tribal Groundfish	0.43	4.47	4.74	0.58	10.22	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	13.37	13.37	97.96	9.33	134.03	86.89	35.50	27.41	14.88	164.67
Alternative 2										
Shoreside LE Trawl	3.81	0.80	14.05	-	18.66	16.64	14.80	5.86	1.53	38.83
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.52	0.66	1.23	-	4.41	0.82	1.56	1.23	0.59	4.21
Open Access	0.03	0.14	0.59	-	0.76	0.31	0.08	0.38	1.28	2.04
Tribal Groundfish	0.43	4.47	5.19	0.58	10.66	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	14.89	13.67	102.44	9.33	140.33	93.59	40.20	29.91	15.65	179.35
Alternative 3										
Shoreside LE Trawl	3.87	0.82	18.16	-	22.86	18.32	18.23	6.18	1.54	44.27
At Sea Whiting	-	-	-	-	0.00	-	-	-	-	0.00
LE Fixed Gear	2.52	0.66	1.23	-	4.42	0.82	1.56	1.23	0.60	4.22
Open Access	0.03	0.14	0.60	-	0.77	0.31	0.08	0.38	1.33	2.10
Tribal Groundfish	0.43	4.47	6.54	0.58	12.01	-	-	-	-	0.00
Tribal Non-Groundfish	1.15	4.39	0.41	8.73	14.68	-	-	-	-	0.00
Non Groundfish	6.95	3.21	80.96	0.02	91.14	75.82	23.76	22.44	12.25	134.26
TOTAL	14.96	13.69	107.90	9.33	145.89	95.28	43.63	30.24	15.72	184.85

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-64a. Estimated income impact projections by State, port area, and major sector. (Page 2 of 2)

	CALIFORNIA									
Alternative / Fishery	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CA TOTAL
2005										
Shoreside LE Trawl	1.27	5.46	3.35	1.53	1.53	0.98	-	-	-	14.12
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.36	0.50	0.37	0.34	0.68	-	0.37	1.08	0.39	4.09
Open Access	0.51	0.40	1.53	0.41	0.83	1.34	0.21	0.12	0.25	5.59
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.15	10.39	8.82	35.45	24.36	4.60	57.66	99.65	8.36	256.44
No Action (2006)										
Shoreside LE Trawl	1.23	5.29	3.50	1.38	1.60	0.95	-	-	-	13.94
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.36	0.50	0.37	0.34	0.68	-	0.37	1.08	0.39	4.10
Open Access	0.51	0.40	1.54	0.41	0.83	1.34	0.21	0.12	0.24	5.61
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.11	10.23	8.98	35.29	24.44	4.56	57.66	99.65	8.36	256.27
Alternative 1										
Shoreside LE Trawl	0.73	3.26	2.13	0.91	1.09	0.62	-	-	-	8.74
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.29	0.38	0.28	0.27	0.57	-	0.30	0.87	0.31	3.27
Open Access	0.46	0.31	1.18	0.36	0.69	1.10	0.19	0.11	0.21	4.61
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	6.49	7.99	7.17	34.70	23.68	3.99	57.56	99.43	8.24	249.25
Alternative 2										
Shoreside LE Trawl	1.38	5.36	4.04	1.45	1.72	1.02	-	-	-	14.97
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.29	0.38	0.28	0.28	0.57	-	0.35	1.04	0.37	3.55
Open Access	0.49	0.31	1.21	0.38	0.71	1.22	0.20	0.11	0.21	4.84
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.16	10.09	9.11	35.27	24.32	4.52	57.63	99.60	8.31	255.99
Alternative 3										
Shoreside LE Trawl	1.39	5.73	4.07	1.47	1.76	1.04	-	-	-	15.45
At Sea Whiting	-	-	-	-	-	-	-	-	-	0.00
LE Fixed Gear	0.29	0.39	0.28	0.28	0.57	-	0.35	1.04	0.37	3.56
Open Access	0.51	0.32	1.24	0.40	0.73	1.33	0.21	0.11	0.21	5.06
Tribal Groundfish	-	-	-	-	-	-	-	-	-	0.00
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	0.00
Non Groundfish	5.01	4.03	3.58	33.16	21.32	2.28	57.08	98.45	7.72	232.63
TOTAL	7.20	10.47	9.17	35.30	24.38	4.65	57.64	99.60	8.31	256.70

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-64b. Change in estimated income impact projections by State, port area, and major sector. (Page 1 of 2)

	WASHINGTON					OREGON				
Alternative / Fishery	Puget Sound	North Washington Coast	South and Central Washington Coast	Unidentified Washington	WASHINGTON TOTAL	Astoria-Tillamook	Newport	Coos Bay	Brookings	OREGON TOTAL
No Action (2006)										
Shoreside LE Trawl	*3.61*	*0.81*	*18.77*	*-*	*23.19*	*17.32*	*18.52*	*5.62*	*1.35*	*42.82*
At Sea Whiting	*-*	*-*	*-*	*-*	*0.00*	*-*	*-*	*-*	*-*	*0.00*
LE Fixed Gear	*3.23*	*0.87*	*1.64*	*-*	*5.74*	*1.09*	*2.08*	*1.64*	*0.77*	*5.59*
Open Access	*0.04*	*0.18*	*0.79*	*-*	*1.01*	*0.37*	*0.09*	*0.49*	*1.50*	*2.45*
Tribal Groundfish	*0.42*	*4.80*	*6.38*	*0.74*	*12.34*	*-*	*-*	*-*	*-*	*0.00*
Tribal Non-Groundfish	*1.15*	*4.39*	*0.41*	*8.73*	*14.68*	*-*	*-*	*-*	*-*	*0.00*
Non Groundfish	*6.95*	*3.21*	*80.96*	*0.02*	*91.14*	*75.82*	*23.76*	*22.44*	*12.25*	*134.26*
TOTAL	*15.40*	*14.26*	*108.94*	*9.49*	*148.10*	*94.62*	*44.45*	*30.19*	*15.87*	*185.12*
Alternative 1										
Shoreside LE Trawl	-1.31	-0.31	-8.73	-	-10.36	-7.39	-8.42	-2.26	-0.53	-18.60
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.71	-0.21	-0.41	-	-1.33	-0.27	-0.52	-0.41	-0.19	-1.38
Open Access	-0.01	-0.04	-0.20	-	-0.25	-0.07	-0.01	-0.11	-0.28	-0.47
Tribal Groundfish	0.01	-0.33	-1.64	-0.16	-2.13	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-2.03	-0.90	-10.98	-0.16	-14.07	-7.73	-8.95	-2.78	-0.99	-20.45
Alternative 2	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.20	-0.01	-4.71	-	-4.52	-0.69	-3.72	0.24	0.18	-3.99
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.71	-0.21	-0.40	-	-1.32	-0.27	-0.52	-0.41	-0.18	-1.38
Open Access	-0.01	-0.04	-0.20	-	-0.25	-0.07	-0.01	-0.11	-0.22	-0.41
Tribal Groundfish	0.01	-0.33	-1.19	-0.16	-1.68	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.51	-0.60	-6.51	-0.16	-7.77	-1.02	-4.26	-0.28	-0.22	-5.78
Alternative 3	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.27	0.01	-0.60	-	-0.33	0.99	-0.29	0.56	0.19	1.46
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.71	-0.21	-0.40	-	-1.32	-0.27	-0.52	-0.41	-0.18	-1.37
Open Access	-0.01	-0.04	-0.19	-	-0.24	-0.06	-0.01	-0.11	-0.17	-0.36
Tribal Groundfish	0.01	-0.33	0.15	-0.16	-0.33	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.44	-0.57	-1.04	-0.16	-2.21	0.66	-0.82	0.05	-0.15	-0.27

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-64b. Change in estimated income impact projections by State, port area, and major sector. (Page 2 of 2)

	CALIFORNIA									
Alternative / Fishery	Crescent City	Eureka	Fort Bragg	Bodega Bay-San Francisco	Monterey	Morro Bay	Santa Barbara	Los Angeles	San Diego	CALIFORNIA TOTAL
No Action (2006)										
Shoreside LE Trawl	*1.23*	*5.29*	*3.50*	*1.38*	*1.60*	*0.95*	-	-	-	*13.94*
At Sea Whiting	-	-	-	-	-	-	-	-	-	*0.00*
LE Fixed Gear	*0.36*	*0.50*	*0.37*	*0.34*	*0.68*	-	*0.37*	*1.08*	*0.39*	*4.10*
Open Access	*0.51*	*0.40*	*1.54*	*0.41*	*0.83*	*1.34*	*0.21*	*0.12*	*0.24*	*5.61*
Tribal Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	*0.00*
Non Groundfish	*5.01*	*4.03*	*3.58*	*33.16*	*21.32*	*2.28*	*57.08*	*98.45*	*7.72*	*232.63*
TOTAL	*7.11*	*10.23*	*8.98*	*35.29*	*24.44*	*4.56*	*57.66*	*99.65*	*8.36*	*256.27*
Alternative 1										
Shoreside LE Trawl	-0.49	-2.03	-1.37	-0.47	-0.50	-0.33	-	-	-	-5.20
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.08	-0.12	-0.09	-0.07	-0.11	-	-0.07	-0.21	-0.08	-0.83
Open Access	-0.05	-0.09	-0.35	-0.06	-0.14	-0.24	-0.02	-0.01	-0.04	-1.00
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	-0.62	-2.24	-1.81	-0.60	-0.76	-0.57	-0.09	-0.21	-0.12	-7.02
Alternative 2	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.15	0.07	0.54	0.08	0.12	0.07	-	-	-	1.03
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.07	-0.12	-0.09	-0.07	-0.11	-	-0.02	-0.04	-0.02	-0.55
Open Access	-0.02	-0.09	-0.33	-0.04	-0.13	-0.12	-0.01	0.00	-0.03	-0.77
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	0.05	-0.14	0.13	-0.03	-0.12	-0.05	-0.03	-0.04	-0.05	-0.28
Alternative 3	-	-	-	-	-	-	-	-	-	-
Shoreside LE Trawl	0.16	0.44	0.57	0.09	0.16	0.09	-	-	-	1.52
At Sea Whiting	-	-	-	-	-	-	-	-	-	-
LE Fixed Gear	-0.07	-0.11	-0.09	-0.07	-0.11	-	-0.02	-0.04	-0.02	-0.54
Open Access	0.00	-0.09	-0.30	-0.01	-0.11	0.00	0.00	0.00	-0.03	-0.54
Tribal Groundfish	-	-	-	-	-	-	-	-	-	-
Tribal Non-Groundfish	-	-	-	-	-	-	-	-	-	-
Non Groundfish	-	-	-	-	-	-	-	-	-	-
TOTAL	0.09	0.24	0.19	0.01	-0.06	0.08	-0.02	-0.04	-0.05	0.43

*Income impacts are a measure of value added generated in the local economy derived from harvesting, processing and support activities connected with Council-managed ocean area commercial fisheries.

Table 7-65a. Projected recreational effort by region in 2004 and 2005 and by alternative.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	52,055	46,978	46,978	33,793	36,456	42,029	
South & Central WA Coast	145,568	125,737	125,737	125,737	125,737	125,737	
Astoria-Tillamook	58,251	40,764	41,794	37,073	41,794	41,794	
Newport	72,331	55,368	58,487	46,177	58,487	58,487	
Coos Bay	50,990	36,238	39,152	35,175	39,152	39,152	
Brookings	35,382	34,128	35,817	27,008	35,817	35,817	
Crescent City-Eureka	47,314	60,292	47,133	42,035	47,133	47,133	
Fort Bragg	52,197	66,162	45,684	36,678	39,153	48,594	
Bodega Bay - San Francisco	108,659	82,922	87,127	56,185	59,618	92,772	
Monterey - Morro Bay	120,830	99,709	114,155	72,564	74,411	138,561	
Santa Barbara	108,104	64,964	67,401	52,335	58,836	72,775	
Los Angeles - San Diego	786,589	500,488	507,907	464,355	483,195	523,296	
TOTAL	1,638,269	1,213,750	1,217,372	1,029,116	1,099,789	1,266,147	

Table 7-65b. Change in projected effort across alternatives.

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	*46,978*	-13,185	-10,522	-4,949	
South & Central WA Coast	*125,737*	-	-	-	
Astoria-Tillamook	*41,794*	-4,720	-	-	
Newport	*58,487*	-12,310	-	-	
Coos Bay	*39,152*	-3,977	0	0	
Brookings	*35,817*	-8,809	-	-	
Crescent City-Eureka	*47,133*	-5,098	-	-	
Fort Bragg	*45,684*	-9,006	-6,530	2,910	
Bodega Bay - San Francisco	*87,127*	-30,942	-27,510	5,644	
Monterey - Morro Bay	*114,155*	-41,591	-39,744	24,406	
Santa Barbara	*67,401*	-15,065	-8,564	5,374	
Los Angeles - San Diego	*507,907*	-43,553	-24,712	15,389	
TOTAL	*1,217,372*	-188,256	-117,582	48,775	

Table 7-66a. Projected angler expenditures by region in 2004 and 2005 and by alternatives.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	3.4	3.0	3.0	2.1	2.3	2.7	
South & Central WA Coast	15.7	14.4	14.4	14.4	14.4	14.4	
Astoria-Tillamook	4.4	3.4	3.4	2.9	3.4	3.4	
Newport	7.7	6.4	6.7	5.0	6.7	6.7	
Coos Bay	3.8	2.8	2.9	2.5	2.9	2.9	
Brookings	2.4	2.4	2.5	1.8	2.5	2.5	
Crescent City-Eureka	2.8	3.0	2.6	2.3	2.6	2.6	
Fort Bragg	4.1	3.6	2.9	2.1	2.3	3.1	
Bodega Bay - San Francisco	10.1	7.7	10.0	5.8	6.1	10.7	
Monterey - Morro Bay	10.2	7.1	11.3	6.1	6.3	13.7	
Santa Barbara	10.8	5.9	6.4	4.9	5.6	6.8	
Los Angeles - San Diego	81.0	45.4	46.7	42.4	44.4	48.0	
TOTAL	156	105	113	92	99	118	

Table 7-66b. Change in projected angler expenditures across alternatives.

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	*3.0*	-0.9	-0.7	-0.3	
South & Central WA Coast	*14.4*	-	-	-	
Astoria-Tillamook	*3.4*	-0.5	-	-	
Newport	*6.7*	-1.8	-	-	
Coos Bay	*2.9*	-0.4	-	-	
Brookings	*2.5*	-0.7	-	-	
Crescent City-Eureka	*2.6*	-0.3	-	-	
Fort Bragg	*2.9*	-0.8	-0.6	0.2	
Bodega Bay - San Francisco	*10.0*	-4.2	-3.9	0.7	
Monterey - Morro Bay	*11.3*	-5.2	-5.0	2.4	
Santa Barbara	*6.4*	-1.5	-0.8	0.4	
Los Angeles - San Diego	*46.7*	-4.3	-2.4	1.3	
TOTAL	*113*	-21	-13	5	

Table 7-67a. Projected recreational income impacts by region in 2004 and 2005, and by alternatives.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Preferred
North Washington Coast	2.6	2.4	2.4	1.7	1.8	2.1	
South & Central WA Coast	13.2	12.1	12.1	12.1	12.1	12.1	
Astoria-Tillamook	3.3	2.5	2.6	2.2	2.6	2.6	
Newport	5.9	5.0	5.2	3.9	5.2	5.2	
Coos Bay	2.8	2.1	2.2	1.9	2.2	2.2	
Brookings	1.8	1.8	1.9	1.3	1.9	1.9	
Crescent City-Eureka	2.3	2.4	2.1	1.9	2.1	2.1	
Fort Bragg	3.4	2.9	2.3	1.7	1.8	2.5	
Bodega Bay - San Francisco	8.4	6.4	8.4	4.8	5.1	9.0	
Monterey - Morro Bay	7.9	5.5	8.7	4.7	4.9	10.6	
Santa Barbara	8.4	4.6	4.9	3.8	4.3	5.3	
Los Angeles - San Diego	62.6	35.1	36.1	32.8	34.3	37.1	
TOTAL	123	83	89	73	78	93	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-67b. Change in recreational income impacts by region by alternative.

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	*2.4*	-0.7	-0.6	-0.2	
South & Central WA Coast	*12.1*	-	-	-	
Astoria-Tillamook	*2.6*	-0.4	-	-	
Newport	*5.2*	-1.4	-	-	
Coos Bay	*2.2*	-0.3	-	-	
Brookings	*1.9*	-0.5	-	-	
Crescent City-Eureka	*2.1*	-0.2	-	-	
Fort Bragg	*2.3*	-0.6	-0.5	0.2	
Bodega Bay - San Francisco	*8.4*	-3.6	-3.3	0.6	
Monterey - Morro Bay	*8.7*	-4.0	-3.9	1.8	
Santa Barbara	*4.9*	-1.1	-0.6	0.3	
Los Angeles - San Diego	*36.1*	-3.4	-1.8	1.0	
TOTAL	*89*	-16	-11	4	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68a. Projected recreation employment impacts by region by alternative.

Region	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	118	106	106	74	80	96	
South & Central WA Coast	591	546	546	546	546	546	
Astoria-Tillamook	149	114	117	99	117	117	
Newport	267	225	236	173	236	236	
Coos Bay	126	93	99	84	99	99	
Brookings	81	79	83	60	83	83	
Crescent City-Eureka	90	95	82	74	82	82	
Fort Bragg	135	115	93	68	72	99	
Bodega Bay - San Francisco	333	254	333	191	203	356	
Monterey - Morro Bay	273	191	303	164	168	367	
Santa Barbara	291	158	171	131	149	183	
Los Angeles - San Diego	2,171	1,217	1,254	1,138	1,190	1,288	
TOTAL	4,625	3,194	3,422	2,802	3,025	3,551	

*Employment impacts are a measure of employment generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68b. Change in recreation employment impacts by region by area.

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
North Washington Coast	*106*	-32	-26	-10	
South & Central WA Coast	*546*	-	-	-	
Astoria-Tillamook	*117*	-18	-	-	
Newport	*236*	-63	-	-	
Coos Bay	*99*	-15	-	-	
Brookings	*83*	-23	-	-	
Crescent City-Eureka	*82*	-8	-	-	
Fort Bragg	*93*	-25	-20	6	
Bodega Bay - San Francisco	*333*	-142	-131	22	
Monterey - Morro Bay	*303*	-138	-134	64	
Santa Barbara	*171*	-40	-22	12	
Los Angeles - San Diego	*1,254*	-116	-64	34	
TOTAL	*3,422*	-620	-397	129	

*Employment impacts are a measure of employment generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68c. Projected Recreational Employment impacts by state, region, and trip target by alternative.

State	Region	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
WASHINGTON									
	North Washington Coast								
		Groundfish	13	24	24	12	16	18	
		Halibut	41	39	39	18	21	35	
		Other	63	44	44	43	44	43	
		TOTAL	118	106	106	74	80	96	
	South & Central WA Coast								
		Groundfish	97	110	110	110	110	110	
		Halibut	33	29	29	29	29	29	
		Other	461	407	407	407	407	407	
		TOTAL	591	546	546	546	546	546	
WASHINGTON TOTALS									
		Groundfish	110	133	133	122	125	128	
		Halibut	75	67	67	47	50	63	
		Other	524	451	451	451	451	451	
		TOTAL	709	652	652	620	626	642	
OREGON									
	Astoria-Tillamook								
		Groundfish	33	42	44	27	44	44	
		Halibut	9	12	13	13	13	13	
		Other	106	60	59	59	59	59	
		TOTAL	149	114	117	99	117	117	
	Newport								
		Groundfish	118	150	158	96	158	158	
		Halibut	26	29	30	30	30	30	
		Other	123	46	47	47	47	47	
		TOTAL	267	225	236	173	236	236	
	Coos Bay								
		Groundfish	32	35	37	22	37	37	
		Halibut	7	6	6	6	6	6	
		Other	87	53	57	57	57	57	
		TOTAL	126	93	99	84	99	99	
	Brookings								
		Groundfish	45	56	59	36	59	59	
		Halibut	0	0	0	0	0	0	
		Other	36	23	24	24	24	24	
		TOTAL	81	79	83	60	83	83	
OREGON TOTALS									
		Groundfish	229	283	298	180	298	298	
		Halibut	43	47	50	50	50	50	
		Other	352	182	187	187	187	187	
		TOTAL	623	512	535	417	535	535	
CALIFORNIA									
	North Coast: Humboldt and Del Norte counties								
		Groundfish	70	93	79	71	79	79	
		Other	20	3	3	3	3	3	
		TOTAL	90	95	82	74	82	82	
	North-Central Coast: Sonoma and Mendocino counties								
		Groundfish	82	99	77	52	57	83	
		Other	53	16	16	16	16	16	
		TOTAL	135	115	93	68	72	99	
	North-Central Coast: San Mateo County up through Marin County								
		Groundfish	166	192	271	129	140	294	
		Other	168	62	62	62	62	62	
		TOTAL	333	254	333	191	203	356	
	South-Central Coast: San Luis Obispo County through Santa Cruz County								
		Groundfish	204	178	290	152	156	354	
		Other	69	13	13	13	13	13	
		TOTAL	273	191	303	164	168	367	
	South Coast: Ventura and Santa Barbara counties								
		Groundfish	114	94	106	67	84	118	
		Other	177	64	64	64	64	64	
		TOTAL	291	158	171	131	149	183	
	South Coast: San Diego County through Los Angeles County								
		Groundfish	338	275	312	196	248	347	
		Other	1,834	942	942	942	942	942	
		TOTAL	2,171	1,217	1,254	1,138	1,190	1,288	
CALIFORNIA TOTALS									
		Groundfish	973	931	1,136	666	765	1,275	
		Other	2,320	1,100	1,100	1,100	1,100	1,100	
		TOTAL	3,293	2,031	2,235	1,765	1,864	2,374	

Table 7-68d Projected West Coast Recreational Income by state, boat type and alternative

Estimated West Coast income impacts* resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2004 and 2005, and projected income impacts under the management alternatives (million $)

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State	Region	Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
WASHINGTON										
	North Washington Coast									
		Charter								
			Groundfish	0.03	0.12	0.12	0.06	0.07	0.10	
			Halibut	0.66	0.59	0.59	0.31	0.35	0.54	
			Other	0.47	0.33	0.33	0.33	0.33	0.33	
			TOTAL	1.16	1.04	1.04	0.70	0.75	0.96	
		Private								
			Groundfish	0.26	0.41	0.41	0.22	0.28	0.31	
			Halibut	0.26	0.27	0.27	0.10	0.12	0.23	
			Other	0.94	0.65	0.65	0.64	0.64	0.63	
			TOTAL	1.46	1.32	1.32	0.96	1.03	1.17	
	South & Central WA Coast									
		Charter								
			Groundfish	2.10	2.37	2.37	2.37	2.37	2.37	
			Halibut	0.74	0.62	0.62	0.62	0.62	0.62	
			Other	7.48	6.87	6.87	6.87	6.87	6.87	
			TOTAL	10.32	9.86	9.86	9.86	9.86	9.86	
		Private								
			Groundfish	0.06	0.07	0.07	0.07	0.07	0.07	
			Halibut	0.01	0.01	0.01	0.01	0.01	0.01	
			Other	2.76	2.20	2.20	2.20	2.20	2.20	
			TOTAL	2.83	2.28	2.28	2.28	2.28	2.28	
WASHINGTON TOTALS										
		Charter								
			Groundfish	2.13	2.49	2.49	2.43	2.44	2.47	
			Halibut	1.40	1.21	1.21	0.93	0.97	1.16	
			Other	7.95	7.20	7.20	7.20	7.19	7.20	
			TOTAL	11.48	10.90	10.90	10.56	10.61	10.83	
		Private								
			Groundfish	0.32	0.48	0.48	0.29	0.35	0.38	
			Halibut	0.27	0.28	0.28	0.11	0.13	0.25	
			Other	3.70	2.84	2.84	2.83	2.84	2.83	
			TOTAL	4.29	3.60	3.60	3.24	3.31	3.45	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-xx. Estimated West Coast income impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2004 and 2005, and projected income impacts under the management alternatives (million $) (page 2 of 3).

State	Region	Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
OREGON										
	Astoria-Tillamook									
		Charter								
			Groundfish	0.65	0.71	0.75	0.45	0.75	0.75	
			Halibut	0.15	0.21	0.22	0.22	0.22	0.22	
			Other	0.79	0.49	0.48	0.48	0.48	0.48	
			TOTAL	1.58	1.41	1.45	1.15	1.45	1.45	
		Private								
			Groundfish	0.09	0.23	0.24	0.15	0.24	0.24	
			Halibut	0.06	0.07	0.07	0.07	0.07	0.07	
			Other	1.58	0.83	0.84	0.84	0.84	0.84	
			TOTAL	1.73	1.13	1.16	1.06	1.16	1.16	
	Newport									
		Charter								
			Groundfish	2.48	3.08	3.25	1.96	3.25	3.25	
			Halibut	0.34	0.34	0.36	0.36	0.36	0.36	
			Other	1.66	0.63	0.60	0.60	0.60	0.60	
			TOTAL	4.47	4.05	4.22	2.93	4.22	4.22	
		Private								
			Groundfish	0.16	0.26	0.28	0.17	0.28	0.28	
			Halibut	0.25	0.30	0.32	0.32	0.32	0.32	
			Other	1.08	0.40	0.44	0.44	0.44	0.44	
			TOTAL	1.48	0.96	1.03	0.92	1.03	1.03	
	Coos Bay									
		Charter								
			Groundfish	0.60	0.58	0.61	0.37	0.61	0.61	
			Halibut	0.11	0.07	0.07	0.07	0.07	0.07	
			Other	0.57	0.37	0.35	0.35	0.35	0.35	
			TOTAL	1.27	1.01	1.03	0.79	1.03	1.03	
		Private								
			Groundfish	0.12	0.20	0.21	0.13	0.21	0.21	
			Halibut	0.05	0.05	0.06	0.06	0.06	0.06	
			Other	1.38	0.82	0.91	0.91	0.91	0.91	
			TOTAL	1.55	1.07	1.17	1.09	1.17	1.17	
	Brookings									
		Charter								
			Groundfish	0.58	0.63	0.67	0.40	0.67	0.67	
			Halibut	0.00	0.00	0.00	0.00	0.00	0.00	
			Other	0.11	0.05	0.05	0.05	0.05	0.05	
			TOTAL	0.69	0.69	0.72	0.46	0.72	0.72	
		Private								
			Groundfish	0.43	0.61	0.64	0.39	0.64	0.64	
			Halibut	0.00	0.00	0.00	0.00	0.00	0.00	
			Other	0.69	0.47	0.49	0.49	0.49	0.49	
			TOTAL	1.12	1.08	1.13	0.88	1.13	1.13	
OREGON TOTALS										
		Charter								
			Groundfish	4.30	5.00	5.27	3.19	5.27	5.27	
			Halibut	0.59	0.62	0.66	0.66	0.66	0.66	
			Other	3.12	1.53	1.49	1.49	1.49	1.49	
			TOTAL	8.00	7.16	7.42	5.33	7.42	7.42	
		Private								
			Groundfish	0.80	1.30	1.37	0.83	1.37	1.37	
			Halibut	0.36	0.42	0.45	0.45	0.45	0.45	
			Other	4.72	2.52	2.67	2.67	2.67	2.67	
			TOTAL	5.88	4.24	4.50	3.95	4.50	4.50	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68d continued. Estimated West Coast income impacts resulting from recreational ocean angler expenditures by state, region, boat type and trip target in 2004 and 2005, and projected income impacts under the management alternatives (million $)

State	Region	Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
CALIFORNIA										
	North Coast: Humboldt and Del Norte counties									
		Charter								
			Groundfish	0.63	0.16	0.39	0.37	0.39	0.39	
			Other	0.03	0.00	0.00	0.00	0.00	0.00	
			TOTAL	0.66	0.16	0.39	0.37	0.39	0.39	
		Private								
			Groundfish	1.14	2.17	1.60	1.42	1.60	1.60	
			Other	0.47	0.07	0.07	0.07	0.07	0.07	
			TOTAL	1.60	2.24	1.68	1.49	1.68	1.68	
	North-Central Coast: Sonoma and Mendocino counties									
		Charter								
			Groundfish	1.12	0.39	0.70	0.30	0.32	0.76	
			Other	0.89	0.16	0.16	0.16	0.16	0.16	
			TOTAL	2.01	0.55	0.85	0.45	0.48	0.91	
		Private								
			Groundfish	0.94	2.11	1.24	1.02	1.10	1.33	
			Other	0.45	0.24	0.24	0.24	0.24	0.24	
			TOTAL	1.39	2.35	1.48	1.26	1.35	1.58	
	North-Central Coast: San Mateo County up through Marin County									
		Charter								
			Groundfish	3.04	3.33	5.95	2.52	2.75	6.45	
			Other	3.03	1.29	1.29	1.29	1.29	1.29	
			TOTAL	6.07	4.62	7.24	3.81	4.04	7.74	
		Private								
			Groundfish	1.14	1.50	0.88	0.72	0.78	0.95	
			Other	1.19	0.28	0.28	0.28	0.28	0.28	
			TOTAL	2.33	1.78	1.16	1.00	1.07	1.23	
	South-Central Coast: San Luis Obispo County through Santa Cruz County									
		Charter								
			Groundfish	4.32	2.86	6.93	3.12	3.21	8.41	
			Other	1.14	0.16	0.16	0.16	0.16	0.16	
			TOTAL	5.46	3.02	7.09	3.28	3.37	8.58	
		Private								
			Groundfish	1.57	2.29	1.43	1.25	1.28	1.79	
			Other	0.84	0.20	0.20	0.20	0.20	0.20	
			TOTAL	2.41	2.48	1.63	1.44	1.48	1.99	
	South Coast: Ventura and Santa Barbara counties									
		Charter								
			Groundfish	2.88	2.28	2.69	1.76	2.19	2.92	
			Other	4.03	1.16	1.16	1.16	1.16	1.16	
			TOTAL	6.90	3.44	3.85	2.92	3.35	4.08	
		Private								
			Groundfish	0.41	0.43	0.38	0.16	0.25	0.49	
			Other	1.07	0.70	0.70	0.70	0.70	0.70	
			TOTAL	1.48	1.13	1.08	0.86	0.94	1.19	
	South Coast: San Diego County through Los Angeles County									
		Charter								
			Groundfish	8.93	6.74	7.93	5.19	6.47	8.62	
			Other	43.67	19.62	19.62	19.62	19.62	19.62	
			TOTAL	52.60	26.36	27.55	24.81	26.09	28.23	
		Private								
			Groundfish	0.80	1.20	1.06	0.45	0.69	1.38	
			Other	9.20	7.53	7.53	7.53	7.53	7.53	
			TOTAL	10.00	8.73	8.59	7.98	8.22	8.90	
CALIFORNIA TOTALS										
		Charter								
			Groundfish	20.91	15.76	24.58	13.26	15.34	27.54	
			Other	52.78	22.39	22.39	22.39	22.39	22.39	
			TOTAL	73.69	38.14	46.97	35.65	37.72	49.93	
		Private								
			Groundfish	5.98	9.70	6.60	5.02	5.71	7.54	
			Other	13.23	9.02	9.02	9.02	9.02	9.02	
			TOTAL	19.21	18.72	15.62	14.04	14.72	16.56	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68e Summary of total three State Recreational Impacts (trips, expenditures, income) by boat type and trip target.

Summary of total three-state (W-O-C) estimated recreational ocean angler effort (angler trips), expenditures (million $), and income impacts* (million $) by boat type and trip target in 2004 and 2005, and projected under the management alternatives.

Boat Type	Trip Target	2004	2005	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Effort (angler trips)								
Charter								
	Groundfish	233,899	193,408	274,064	157,363	191,839	301,153	
	Halibut	12,002	11,218	11,470	9,910	10,141	11,162	
	Other	562,420	261,621	261,266	261,260	261,251	261,264	
	TOTAL	808,321	466,247	546,801	428,534	463,232	573,579	
Private								
	Groundfish	195,319	314,162	232,285	167,764	203,186	255,741	
	Halibut	18,122	20,141	20,784	15,653	16,105	19,818	
	Other	616,508	413,200	417,502	417,165	417,267	417,009	
	TOTAL	829,948	747,503	670,571	600,582	636,558	692,567	
Charter+Private								
	Groundfish	429,217	507,570	506,349	325,127	395,025	556,893	
	Halibut	30,124	31,359	32,254	25,563	26,246	30,980	
	Other	1,178,928	674,821	678,768	678,425	678,518	678,273	
	TOTAL	1,638,269	1,213,750	1,217,372	1,029,116	1,099,789	1,266,147	
Angler Expenditures (million $)								
Charter								
	Groundfish	34.34	29.05	40.46	23.56	28.84	44.20	
	Halibut	2.32	2.16	2.20	1.88	1.93	2.14	
	Other	80.82	38.90	38.84	38.84	38.84	38.84	
	TOTAL	117.48	70.11	81.50	64.28	69.61	85.18	
Private								
	Groundfish	9.19	14.84	11.01	7.96	9.68	12.07	
	Halibut	0.88	0.99	1.02	0.79	0.81	0.98	
	Other	28.80	19.12	19.34	19.33	19.33	19.32	
	TOTAL	38.88	34.94	31.37	28.07	29.82	32.37	
Charter+Private								
	Groundfish	43.53	43.89	51.47	31.51	38.52	56.28	
	Halibut	3.21	3.14	3.22	2.67	2.74	3.11	
	Other	109.62	58.02	58.18	58.17	58.17	58.16	
	TOTAL	156.36	105.05	112.87	92.35	99.43	117.55	
Income Impacts (million $)								
Charter								
	Groundfish	27.34	23.25	32.35	18.88	23.05	35.28	
	Halibut	1.99	1.84	1.87	1.59	1.63	1.82	
	Other	63.85	31.12	31.07	31.07	31.07	31.07	
	TOTAL	93.18	56.20	65.29	51.54	55.75	68.17	
Private								
	Groundfish	7.10	11.48	8.45	6.14	7.43	9.30	
	Halibut	0.63	0.70	0.73	0.56	0.58	0.69	
	Other	21.65	14.38	14.54	14.53	14.53	14.52	
	TOTAL	29.38	26.56	23.72	21.23	22.53	24.51	
Charter+Private								
	Groundfish	34.44	34.72	40.80	25.02	30.48	44.58	
	Halibut	2.62	2.54	2.60	2.15	2.21	2.51	
	Other	85.50	45.50	45.61	45.60	45.60	45.59	
	TOTAL	122.56	82.76	89.01	72.76	78.29	92.68	

*Income impacts are a measure of value added generated in the local economy resulting from expenditures associated with recreational fishing trips.

Table 7-68f Combined recreational and income impacts by region and alternative and **7.68g Change in combined recreational and commercial impacts by region and alternative**

Table 7-68f Summary of estimated income impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (million $).

Region	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	15.40	13.37	14.89	14.96	
North Washington Coast	16.62	15.02	15.45	15.83	
South & Central WA Coast	121.08	110.10	114.58	120.04	
Astoria-Tillamook	97.22	89.10	96.20	97.88	
Newport	49.70	39.35	45.45	48.88	
Coos Bay	32.39	29.29	32.12	32.44	
Brookings	17.72	16.21	17.50	17.57	
Crescent City-Eureka	19.40	16.34	19.32	19.73	
Fort Bragg	11.32	8.88	10.93	11.65	
Bodega Bay - San Francisco	43.69	39.51	40.37	44.27	
Monterey - Morro Bay	37.72	32.39	33.69	39.59	
Santa Barbara	62.58	61.34	61.92	62.90	
Los Angeles - San Diego	144.15	140.47	142.21	145.05	
TOTAL	669.01	611.38	644.62	670.80	

Table 7-68g Change (from No Action) in estimated income impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (million $).

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	*15.4*	-2.0	-0.5	-0.4	
North Washington Coast	*16.6*	-1.6	-1.2	-0.8	
South & Central WA Coast	*121.1*	-11.0	-6.5	-1.0	
Astoria-Tillamook	*97.2*	-8.1	-1.0	0.7	
Newport	*49.7*	-10.4	-4.3	-0.8	
Coos Bay	*32.4*	-3.1	-0.3	0.0	
Brookings	*17.7*	-1.5	-0.2	-0.2	
Crescent City-Eureka	*19.4*	-3.1	-0.1	0.3	
Fort Bragg	*11.3*	-2.4	-0.4	0.3	
Bodega Bay - San Francisco	*43.7*	-4.2	-3.3	0.6	
Monterey - Morro Bay	*37.7*	-5.3	-4.0	1.9	
Santa Barbara	*62.6*	-1.2	-0.7	0.3	
Los Angeles - San Diego	*144.2*	-3.7	-1.9	0.9	
TOTAL	*669.01*	-57.63	-24.39	1.78	

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Table 7-58h Combined recreational and commercial employment impacts by region and alternative and Table 7-59i Change in combined recreational and commercial employment impacts by region and alternative

Table 7-68h Summary of estimated employment impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (number of jobs).

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	*692*	601	669	672	
North Washington Coast	*747*	675	694	711	
South & Central WA Coast	*5,442*	4,948	5,149	5,395	
Astoria-Tillamook	*4,365*	4,000	4,319	4,395	
Newport	*2,231*	1,767	2,040	2,194	
Coos Bay	*1,454*	1,315	1,442	1,456	
Brookings	*796*	728	786	789	
Crescent City-Eureka	*770*	649	767	783	
Fort Bragg	*449*	353	434	463	
Bodega Bay - San Francisco	*1,735*	1,569	1,603	1,757	
Monterey - Morro Bay	*1,431*	1,242	1,290	1,496	
Santa Barbara	*2,171*	2,128	2,148	2,182	
Los Angeles - San Diego	*5,000*	4,872	4,933	5,031	
TOTAL	*27,283*	24,847	26,275	27,325	

Table 7-68i. Change (from No Action) in estimated employment impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (number of jobs).

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	*692*	-91	-23	-20	
North Washington Coast	*747*	-72	-53	-36	
South & Central WA Coast	*5,442*	-494	-292	-47	
Astoria-Tillamook	*4,365*	-365	-46	30	
Newport	*2,231*	-465	-191	-37	
Coos Bay	*1,454*	-139	-12	2	
Brookings	*796*	-68	-10	-7	
Crescent City-Eureka	*770*	-122	-3	13	
Fort Bragg	*449*	-97	-15	13	
Bodega Bay - San Francisco	*1,735*	-166	-132	23	
Monterey - Morro Bay	*1,431*	-189	-140	65	
Santa Barbara	*2,171*	-43	-23	11	
Los Angeles - San Diego	*5,000*	-128	-67	31	
TOTAL	*27,283*	-2,437	-1,009	42	

Table 7.69 Exvessel Value and Number of Angler Trips Lost under Zero Harvest of Rebuilding Species Alternatives

		Darkblotched and POP	Canary and Yelloweye	Bocaccio and Cowcod	Widow	All Overfished Species	Total 2005
Major Sector	Sub sector or area-based stratification	Lost Revenue	Lost Revenue	Lost Revenue	Lost Revenue	Lost Revenue	Lost Revenue
Groundfish Bottom Trawl	Coastwide Groundfish Bottom trawl					22,297,476	22,297,476
	Slope bottom trawl coastwide						
	Slope bottom trawl N 38	14,315,600					
	Shelf bottom trawl coastwide				6,911,000		
	Shelf bottom trawl N 36		6,511,000				
	Shelf bottom trawl S 40 10			2,648,300			
Whiting non-tribal	Coastwide Non-tribal Whiting	27,116,070	27,116,070		27,116,070	27,116,070	27,116,070
Non-tribal Fixed Gear	Coastwide Non-tribal Fixed gear					19,475,005	19,475,005
	Sablefish N CP	11,656,796	11,656,796				
	Sable S 40 10			2,051,515			
	Non-Sablefish FG Offshore N CP		545,341				
	Non-Sablefish FG Offshore N 40 10	436,698			436,698		
	Non-Sablefish FG Offshore S 40 10			1,464,944			
	Nearshore Coastwide		2,706,502				
	Nearshore N 40 10				1,379,012		
	Nearshore S 40 10						
Non-Groundfish Trawl	Coastwide non-gfish trawl			3,299,717		3,299,717	3,299,717
	CA Halibut		2,839,900	2,839,900		2,839,900	
	Other bottom Trawl			459,817		459,817	
Coastal Pelagic S 40 10				36,474,379		36,474,379	36,474,379
Shrimp and Prawn Trawl	Shrimp and prawn trawl coastwide					10,745,489	10,745,489
	Pink Shrimp coastwide	10,410,400	10,410,400		10,410,400	10,410,400	
	Pink Shrimp S 40 10			227,300			
	Prawn Trawl			335,089		335,089	
Salmon Troll	Salmon Troll Coastwide		24,032,949		24,032,949	24,032,949	24,032,949
	Salmon Troll S 40 10			1,086,424			
Tribal Fisheries	Tribal groundfish and salmon		10,185,700			10,185,700	10,185,700
	Tribal bottom trawl	693,379	693,379			693,379	
	Tribal sablefish		3,340,263			3,340,263	
	Tribal midwater		662,488		662,488	662,488	
	Tribal salmon troll		1,400,000			1,400,000	
	Tribal whiting		4,089,570			4,089,570	
Recreational Fisheries (trips)	California ground/misc/samn		831,966	741,569	831,966	831,966	831,966
	recreational groundfish California		407,472		407,472	407,472	
	recreational south 40 10 only			349,046			
	recreational misc California						

		Darkblotched and POP	Canary and Yelloweye	Bocaccio and Cowcod	Widow	All Overfished Species	Total 2005
			392,523		392,523	392,523	
	recreational south 40 10 only			392,523			
	recreational salmon California		31,971		31,971	31,971	
	recreational south 40 10 only			30,605			
	Oregon ground/hal/samn/misc		165,025		165,025	165,025	165,025
	recreational groundfish OR		75,337		75,337	75,337	
	recreational halibut OR		16,871		16,871	16,871	
	recreational salmon OR		61,853		61,853	61,853	
	recreational combined/misc OR		10,964		10,964	10,964	
	Washington ground/hal/samn/misc		152,527			152,527	152,527
	recreational groundfish WA		28,671			28,671	
	recreational halibut WA		15,383			15,383	
	recreational combined/misc WA		905			905	
	recreational salmon WA		107,568			107,568	
	Exvessel value loss	64,628,943	106,190,358	50,887,385	70,948,617	177,857,691	
	Angler trip loss		1,149,518	741,569	996,991	1,149,518	

Commercial Impacts

Table below shows the percentage change in estimated commercial fishery income impacts by port group compared to the No Action Alternative for shoreside landings.

Table 7-70. Summary of percentage change in estimated commercial fishery income impacts by port group compared to No Action Alternative (shoreside landings only).

	No Action (2006)		Alt 1		Alt 2		Alt 3	
	Shoreside commercial fishery income impacts generated by:							
Port Group Area	***All Council-managed fisheries***	***Groundfish fisheries***	**All Council-managed fisheries**	**Groundfish fisheries**	**All Council-managed fisheries**	**Groundfish fisheries**	**All Council-managed fisheries**	**Groundfish fisheries**
Puget Sound	*15.4*	*7.3*	-13.0%	-27.4%	-3.2%	-6.8%	-2.6%	-5.5%
North Washington Coast	*14.3*	*6.7*	-6.3%	-13.4%	-4.2%	-9.0%	-4.2%	-9.0%
South and Central Washington Coast	*108.9*	*27.6*	-10.0%	-39.9%	-6.0%	-23.6%	-0.9%	-4.0%
Unidentified Washington	*9.5*	*0.7*	-2.1%	-14.3%	-2.1%	-14.3%	-2.1%	-14.3%
Astoria-Tillamook	*94.6*	*18.8*	-8.1%	-41.0%	-1.1%	-5.3%	0.7%	3.7%
Newport	*44.5*	*20.7*	-20.2%	-43.5%	-9.7%	-20.8%	-2.0%	-3.9%
Coos Bay	*30.2*	*7.8*	-9.3%	-35.9%	-1.0%	-3.8%	0.0%	0.0%
Brookings	*15.9*	*3.6*	-6.3%	-27.8%	-1.9%	-5.6%	-1.3%	-2.8%
Crescent City	*7.1*	*2.1*	-8.5%	-28.6%	1.4%	4.8%	1.4%	4.8%
Eureka	*10.2*	*6.2*	-21.6%	-35.5%	-1.0%	-1.6%	2.9%	3.2%
Fort Bragg	*9*	*5.4*	-20.0%	-33.3%	1.1%	1.9%	2.2%	3.7%
Bodega Bay-San Francisco	*35.3*	*2.1*	-1.7%	-28.6%	0.0%	0.0%	0.0%	0.0%
Monterey	*24.4*	*3.1*	-2.9%	-22.6%	-0.4%	-3.2%	0.0%	0.0%
Morro Bay	*4.6*	*2.3*	-13.0%	-26.1%	-2.2%	-4.3%	0.0%	4.3%
Santa Barbara	*57.7*	*0.6*	-0.2%	-16.7%	-0.3%	-16.7%	-0.2%	0.0%
Los Angeles	*99.6*	*1.2*	-0.2%	-16.7%	0.0%	0.0%	0.0%	0.0%
San Diego	*8.4*	*0.6*	-2.4%	-16.7%	-1.2%	0.0%	-1.2%	0.0%

Table 7-71. Summary of percentage change in estimated recreational income impacts by region compared to No Action Alternative.

State	Region	Boat Type	*No Action*	Alt 1	Alt 2	Alt 3
WASHINGTON						
	North Washington Coast					
		Charter				
		Groundfish	*0.12*	-50.0%	-41.7%	-16.7%
		TOTAL	*1.04*	-32.7%	-27.9%	-7.7%
		Private				
		Groundfish	*0.41*	-46.3%	-31.7%	-24.4%
		TOTAL	*1.32*	-27.3%	-22.0%	-11.4%
	South & Central WA Coast					
		Charter				
		Groundfish	*2.37*	0.0%	0.0%	0.0%
		TOTAL	*9.86*	0.0%	0.0%	0.0%
		Private				
		Groundfish	*0.07*	0.0%	0.0%	0.0%
		TOTAL	*2.28*	0.0%	0.0%	0.0%
OREGON						
	Astoria-Tillamook					
		Charter				
		Groundfish	*0.75*	-40.0%	0.0%	0.0%
		TOTAL	*1.45*	-20.7%	0.0%	0.0%
		Private				
		Groundfish	*0.24*	-37.5%	0.0%	0.0%
		TOTAL	*1.16*	-8.6%	0.0%	0.0%
	Newport					
		Charter				
		Groundfish	*3.25*	-39.7%	0.0%	0.0%
		TOTAL	*4.22*	-30.6%	0.0%	0.0%
		Private				
		Groundfish	*0.28*	-39.3%	0.0%	0.0%
		TOTAL	*1.03*	-10.7%	0.0%	0.0%
	Coos Bay					
		Charter				
		Groundfish	*0.61*	-39.3%	0.0%	0.0%
		TOTAL	*1.03*	-23.3%	0.0%	0.0%
		Private				
		Groundfish	*0.21*	-38.1%	0.0%	0.0%
		TOTAL	*1.17*	-6.8%	0.0%	0.0%
	Brookings					
		Charter				
		Groundfish	*0.67*	-40.3%	0.0%	0.0%
		TOTAL	*0.72*	-36.1%	0.0%	0.0%
		Private				
		Groundfish	*0.64*	-39.1%	0.0%	0.0%
		TOTAL	*1.13*	-22.1%	0.0%	0.0%
CALIFORNIA						
	North Coast: Humboldt and Del Norte counties					
		Charter				
		Groundfish	*0.39*	-5.1%	0.0%	0.0%
		TOTAL	*0.39*	-5.1%	0.0%	0.0%
		Private				

	Groundfish	*1.6*	-11.3%	0.0%	0.0%
	TOTAL	*1.68*	-11.3%	0.0%	0.0%
North-Central Coast: Sonoma and Mendocino counties					
	Charter				
	Groundfish	*0.7*	-57.1%	-54.3%	8.6%
	TOTAL	*0.85*	-47.1%	-43.5%	7.1%
	Private				
	Groundfish	*1.24*	-17.7%	-11.3%	7.3%
	TOTAL	*1.48*	-14.9%	-8.8%	6.8%
North-Central Coast: San Mateo up through Marin County					
	Charter				
	Groundfish	*5.95*	-57.6%	-53.8%	8.4%
	TOTAL	*7.24*	-47.4%	-44.2%	6.9%
	Private				
	Groundfish	*0.88*	-18.2%	-11.4%	8.0%
	TOTAL	*1.16*	-13.8%	-7.8%	6.0%
South-Central Coast: San Luis Obispo County through Santa Cruz					
	Charter				
	Groundfish	*6.93*	-55.0%	-53.7%	21.4%
	TOTAL	*7.09*	-53.7%	-52.5%	21.0%
	Private				
	Groundfish	*1.43*	-12.6%	-10.5%	25.2%
	TOTAL	*1.63*	-11.7%	-9.2%	22.1%
South Coast: Ventura and Santa Barbara counties					
	Charter				
	Groundfish	*2.69*	-34.6%	-18.6%	8.6%
	TOTAL	*3.85*	-24.2%	-13.0%	6.0%
	Private				
	Groundfish	*0.38*	-57.9%	-34.2%	28.9%
	TOTAL	*1.08*	-20.4%	-13.0%	10.2%
South Coast: San Diego County through Los Angeles County					
	Charter				
	Groundfish	*7.93*	-34.6%	-18.4%	8.7%
	TOTAL	*27.55*	-9.9%	-5.3%	2.5%
	Private				
	Groundfish	*1.06*	-57.5%	-34.9%	30.2%
	TOTAL	*8.59*	-7.1%	-4.3%	3.6%

8.0 SUMMARY OF OTHER ENVIRONMENTAL MANAGEMENT ISSUES

Based on the environmental impacts disclosed in Chapters 3 through 7, this chapter summarizes a range of issues that an EIS must address. These issues are identified at 40 CFR 1502.16, describing the analysis of environmental consequences in an EIS. The last two sections in this chapter describe mitigation measures (as required by 40 CFR 1502.16(h)) and identify unavoidable adverse impacts (as required by 40 CFR 1502.16).

8.1 Short-Term Uses Versus Long-Term Productivity

The tradeoff between short-term costs versus long-term risk in setting OYs is possibly the most important tradeoff governing the management of renewable resources. Balancing short-term use and long-term productivity is the essence of the range of harvest specification (OY) alternatives. Short-term uses generally affect the present quality of life for the public, in contrast to long-term productivity, which affects the quality of life for future generations, based on environmental sustainability. The proposed actions indirectly affect the sustainability of marine resources by constraining fishing mortality in 2007–08 consistent with the best available science contained in stock assessments or other information sources. These harvest rates are also consistent with rebuilding plans, as modified according to the proposed actions. The MSA and NSGs establish a framework for rebuilding overfished stocks─establishing long-term productivity─while recognizing short-term use as reflected in the needs of fishing communities. Taken together these actions represent a tradeoff between short-term benefits, reflected in revenue generated from fishing in 2005 and 2006, and long-term productivity of fish stocks, which determines the abundance of fish in the future, and thus future harvests. Managers must respond to changes in resource status, whether a result of harvests or other, environmental factors; this requires effective monitoring of total fishing mortality. A better understanding of the role of environmental and ecological factors play in affecting stock productivity would also enhance managers' ability to predict future stock response to current harvest levels.

Multi year management is based on the framework in the FMP, which dictates how harvest control rules should be set in order to produce sustainable harvests over the long term. While each species' harvest in any one year affects long-term productivity, these harvests are part of an ongoing activity, fishing over many years, which cumulatively affects productivity.

8.2 Irreversible Resource Commitments

An irreversible commitment represents some permanent loss of an environmental attribute or service. The use of non-renewable resources is irreversible; unsustainable renewable resource use may be irreversible if future production is permanently reduced or, at the extreme, is extinguished.

The use of non-renewable energy resources, such as fossil fuel, represents a pervasive irreversible commitment associated with the proposed action because fishing vessels are mechanically powered. The use of energy is discussed below in Section 9.4.

However the proposed action, implemented under the alternatives, does not by itself represent an irreversible commitment, because harvest levels under the Council-preferred OYs are specified for each year in the biennium, and management measures are projected to constrain total fishing mortality to these levels. Inseason monitoring combined with adjustments to the management measures will be used if catch projections indicate harvest levels may be exceeded during either of the two years in the biennial management period. Cumulatively, past, current, and future specifications could result in an irreversible commitment if a stock were to be extirpated or if population size is reduced to such a degree that even if harvesting stopped completely the stock would not recover. Theoretical work, for example, suggests that ecological factors can inhibit recovery of stocks that are reduced to very low biomass levels {MacCall, 2002 597 /id;Walters, 2001 545 /id}. Although several overfished stocks, such as cowcod, bocaccio, canary rockfish, and yelloweye rockfish, are at low biomasses relative to B_{MSY} (the biomass capable of supporting MSY), there can be considerable uncertainty about the likelihood of recovery. For example, the 2002 bocaccio stock assessment and rebuilding analysis {MacCall, 2002 406 /id;MacCall, 2002 407 /id}, used as the basis for setting harvest specifications for 2003, concluded that the stock was unlikely to recover within the rebuilding framework time period (T_{MAX}) even if fishing mortality was reduced to zero. Subsequent stock assessments {MacCall, 2003 663 /id;MacCall, 2006 1207 /id} painted a quite different picture. Detection of a strong 1999 year class in more recent data sets, along with other factors, resulted in a substantial increase in the OYs for 2004 onward in comparison to 2003 (from under 20 mt in 2003 to 309 mt in 2006), based on the Council's rebuilding plan. Given this variability in assessment results, there is not enough information to determine a definite threshold below which population decline is irreversible.

8.3 Irretrievable Resource Commitments

A resource is irretrievably committed if its use is lost for time, but is not actually or practically lost permanently. The analysis of direct, indirect and cumulative impacts in Chapters 3 through 7 generally describe irretrievable resource commitments, and in the case of renewable resources, these parallel the tradeoff between short-term use and long-term productivity. Alternatives that constrain fish harvests to a level related to the harvest specifications and adopted rebuilding plans are predicted to allow future sustainable harvests. The fish that are harvested represent an irretrievable resource commitment, as do the inputs in terms of capital and labor (including energy and resources) needed to harvest and market these fish. In addition, the difference between the current sustainable yield for a stock and the long-term MSY (recognizing this may be only a theoretical optimum) would represent an irretrievable resource commitment.

8.4 Energy Requirements and Conservation Potential of the Alternatives

The proposed action indirectly affects energy use primarily in the form of fossil fuels used to power surveillance craft and fishing vessels. Energy used in at-sea and aerial monitoring and enforcement activities is a direct effect. Change in the level of this type of monitoring is hard to predict because it depends on the types of management measures that will be implemented biennially and inseason. Generally, the RCA, which was first implemented in late 2002, would require more surveillance to be effective. However, the VMS requirement implemented at the beginning of 2004 will compensate for the increased surveillance need because vessel positions can be remotely monitored. Finally, the availability of ships and aircraft to conduct surveillance, which is partly contingent on U.S. Coast Guard mission priorities, will also dictate the level and the number of patrols, affecting energy use. For these reasons, it is difficult to predict how energy use would change from baseline conditions. The proposed action affects fishing activity and thus the consumption of fuel by fishing vessels. Fuel consumption is likely to correlate with projected harvest levels, which are a consequence of the different types of management measures in the alternatives. However, there are a variety of other factors that could affect overall energy use and efficient utilization. Changes in fuel prices, for example, could affect the level of fishing vessel operations independent of the constraining effect of management measures under the alternatives.

8.5 Urban Quality, Historic Resources, and the Design of the Built Environment

The direct and indirect impacts on the urban quality, historic resources, and the built environment will be minimal. Cumulative impacts could be greater. Fishing income has already fallen in many coastal communities, both because of declines in groundfish landings and in other fisheries such as salmon. Cumulative loss of income could lead to a fall in private investment that could curtail maintenance of buildings and other private infrastructure. Public investment, which includes shoreside amenities and marine-related infrastructure such as docks, boat basins, jetties, and navigable channels, is sensitive to changes in tax revenue. By itself, changes in fishing-related revenue may not have an overwhelming impact on local tax revenues, but external factors such as changes in the broader economy could act cumulatively. It is also possible that as private investment shrinks so that, for example, there are fewer fishing vessels using shoreside infrastructure, there will be less political motivation to devote public resources to these uses. In large urban centers, such as Seattle, San Francisco, and the Los Angeles area, the relative impact would be slight and probably not result in changes in urban quality substantially different from the baseline. For small communities, and especially those likely to be more hard hit by declining revenues, the effect on urban quality could be noticeable, especially over the long term (again, depending on external economic factors). These changes could also affect cultural and historic resources as fishing and fishing-dependent activities are supplanted or simply disappear, changing the character of a coastal community. Since the effects described above are speculative; it is not possible to compare the effects of the alternatives beyond projected changes in revenue. No direct impacts of the proposed actions on cultural historic resources protected under the National Historical Preservation Act are expected. Because indirect or cumulative impacts are too speculative, these impacts cannot be predicted.

8.6 Possible Conflicts Between the Proposed Action and Other Plans and Policies For the Affected Area

Overfished groundfish species are caught incidentally in fisheries managed under other Council FMPs (salmon, CPS, and HMS). More restrictive measures are likely to affect these fisheries and thus conflict with some of the objectives of these FMPs. (FMPs try to strike a balance between conservation and utilization, so they include objectives related to resource use.)

8.7 Significant and Unavoidable Adverse Impacts

The EIS must include a discussion of those adverse effects that cannot be avoided (40 CFR 1502.16). This discussion focuses on potentially significant adverse impacts of the proposed action, as implemented by the preferred alternative. Council on Environmental Quality (CEQ) regulations at 40 CFR 1508.27 define “significantly” in terms of both context and intensity, and provide ten factors to consider when evaluating the intensity of an impact. National Oceanic and Atmospheric Administration (NOAA) provides agency guidance in determining significant impacts of fishery management actions in NOAA administrative order (NAO) 216-6 at §6.02, which expands on the CEQ definition. These criteria focus on the components of the human environment most likely to be affected by these types of actions. Based on the guidance in these two sources, the proposed action could result in the following *potentially* significant impacts.

This section to be completed after the Council chooses a preferred alternative.

8.8 Mitigation

An EIS must discuss “means to mitigate the adverse environmental impacts” stemming from the proposed action (40 CFR 1502.16(h)), even if the adverse impacts are not by themselves significant. Alternatives are mitigative to the degree that management measures constrain fishing mortality to levels below the harvest specifications. Further mitigation measures could address the adverse impacts that would still occur with implementation of any of the action alternatives.

This section to be completed after the Council chooses a preferred alternative.

8.9 Environmentally Preferred Alternative and Rationale for Preferred Alternative

NEPA regulations, at 40 CFR 1505.2(b), state that the ROD will identify an alternative or alternatives considered "environmentally preferable." Guidance, in the form of *Forty Most Asked Questions Concerning CEQ's NEPA Regulations*, states that the environmentally preferable alternative is "the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources" (Question 6.A).

This section to be completed after the Council chooses a preferred alternative.

9.0 CONSISTENCY WITH THE GROUNDFISH FMP AND MSA NATIONAL STANDARDS

To be completed after June 2006 Council meeting.

9.1 FMP Goals and Objectives

The Groundfish FMP goals and objectives are listed below. The way in which the harvest specifications and management measures for 2007 and 2008 addresses each objective is briefly described in italics below the relevant statement.

Management Goals.

Goal 1 - Conservation. Prevent overfishing and rebuild overfished stocks by managing for appropriate harvest levels, and prevent, to the extent practicable, any net loss of the habitat of living marine resources.

Goal 2 - Economics. Maximize the value of the groundfish resource as a whole.

Goal 3 - Utilization. Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

Objectives. To accomplish these management goals, a number of objectives will be considered and followed as closely as practicable:

Conservation.

Objective 1. Maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.

Objective 2. Adopt harvest specifications and management measures consistent with resource stewardship responsibilities for each groundfish species or species group.

Objective 3. For species or species groups which are below the level necessary to produce MSY, consider rebuilding the stock to the MSY level and, if necessary, develop a plan to rebuild the stock.

Objective 4. Where conservation problems have been identified for nongroundfish species, and the best scientific information shows the groundfish fishery has a direct impact on the ability of that species to maintain its long-term reproductive health, the Council may consider establishing management measures to control the impacts of groundfish fishing on those species. Management measures may be imposed on the groundfish fishery to reduce fishing mortality of a nongroundfish species for documented conservation reasons. The action will be designed to minimize disruption of the groundfish fishery, in so far as consistent with the goal to minimize the bycatch of nongroundfish species, and will not preclude achievement of a quota, harvest guideline, or allocation of groundfish, if any, unless such action is required by other applicable law.

None of the alternatives include new measures intended to control the impacts of groundfish fishing on nongroundfish stocks.

Objective 5. Describe and identify EFH, adverse impacts on EFH, and other actions to conserve and enhance EFH, and adopt management measures that minimize, to the extent practicable, adverse impacts from fishing on EFH.

Economics.

Objective 6. Attempt to achieve the greatest possible net economic benefit to the nation from the managed fisheries.

Objective 7. Identify those sectors of the groundfish fishery for which it is beneficial to promote year-round marketing opportunities and establish management policies that extend those sectors' fishing and marketing opportunities as long as practicable during the fishing year.

Objective 8. Gear restrictions to minimize the necessity for other management measures will be used whenever practicable.

Utilization.

Objective 9. Develop management measures and policies that foster and encourage full utilization (harvesting and processing) of the Pacific Coast groundfish resources by domestic fisheries.

There has been no foreign fishing on the West Coast for more than a decade, so all of the alternatives meet this objective.

Objective 10. Recognizing the multispecies nature of the fishery and establish a concept of managing by species and gear or by groups of interrelated species.

As in past years, management measures in all of the alternatives use species groups related to particular fisheries or gear to structure trip limits.

Objective 11. Strive to reduce the economic incentives and regulatory measures that lead to wastage of fish. Also, develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. In addition, promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve other information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

GCAs are meant to reduce bycatch of overfished species by prohibiting fishing that generates significant bycatch in areas where these species are most abundant. (GCAs are included in all the alternatives.) In addition, trip limits under all the alternatives are set through model projections that include estimated bycatch, based on data derived from the WCGOP. This provides the best estimates of total fishing-related mortality and bycatch currently available.

Objective 12. Provide for foreign participation in the fishery, consistent with the other goals to take that portion of the OY not utilized by domestic fisheries while minimizing conflict with domestic fisheries.

This objective is no longer relevant, since all stocks are fully utilized by domestic fishers.

Social Factors.

Objective 13. When conservation actions are necessary to protect a stock or stock assemblage, attempt to develop management measures that will affect users equitably.

The Council process facilitates input from resource user groups, state and federal agencies, and the general public. This promotes the formulation of equitable management measures.

Objective 14. Minimize gear conflicts among resource users.

Although redistribution of fishing effort because of GCA closures could increase crowding in nearshore areas, this has not emerged as an issue voiced during scoping for this EIS or through other public comment opportunities during Council meetings.

Objective 15. When considering alternative management measures to resolve an issue, choose the measure that best accomplishes the change with the least disruption of current domestic fishing practices, marketing procedures, and the environment.

Management measures proposed for 2007 and 2008 do not differ substantially in kind from those used since 2004. GCAs have been in use since 2002, and this base of experience has allowed managers to propose configurations that vary less over the course of the year, simplifying their application.

Objective 16. Avoid unnecessary adverse impacts on small entities.

Section 10.3.2 evaluates the impact of the proposed action on small entities, as required by the Regulatory Flexibility Act, based on information and analyses in the EIS.

Objective 17. Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.

The impacts of all the alternatives on communities are evaluated in Sections 7.3.6, 7.4.6, and 7.5.6.

Objective 18. Promote the safety of human life at sea.

GCAs could affect safety if more vessels elect to fish seaward of the closed areas and are more exposed to bad weather conditions. If smaller vessels traditionally fishing in the areas now part of GCAs, or shoreward elect to fish seaward of the GCAs weather-related safety issues could arise. Use of selective flatfish trawl gear north of 40°10' N latitude has not only provided increased trip limits for target species, but has also decreased the size of the trawl RCAs. This provides increased opportunity shoreward of the RCA and decreased incentive for smaller vessels to fish seaward of the RCA. Implementation of a vessel monitoring system capable of sending distress calls could mitigate this safety issue.

9.2 National Standards

An FMP or plan amendment and any pursuant regulations must be consistent with ten national standards contained in the MSA (§301). These are:

National Standard 1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The harvest specification action alternatives all include OY values that reflect harvest rates below the overfishing threshold and include precautionary reductions to rebuild overfished stocks and other stocks that, while not overfished, are at a biomass below the level necessary to produce MSY. The No Action Alternative is not based on the best available science for all stocks and, in some cases, would specify harvest limits that are not sufficiently precautionary.

National Standard 2 states that conservation and management measures shall be based on the best scientific information available.

OY values in the harvest specification action alternatives, including the Council-preferred Alternative, are based on the most recent stock assessments, developed through the peer-review STAR process. This represents the best available science. The No Action Alternative OY values are based on stock assessments conducted in 2004 for management in 2005-2006, the years to which the No Action Alternative management measures apply. Given that more recent stock assessments are available, the No Action Alternative does not use the best available science.

National Standard 3 states that, to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

Some groundfish stocks are managed as individual units with specific trip limits. However, given the multi-species nature of many groundfish fisheries, other stocks are grouped in stock complexes and managed accordingly. This generally applies to non-target species for which no individual stock assessments have been performed. Until recently, landings of many species in groundfish fisheries were not recorded individually. Nongroundfish fisheries also may not report incidental groundfish catches at the species level. This limits the amount of time-series data available for individual species stock assessments. However, whenever possible individual stocks are assessed. Stocks are managed throughout the range of that stock (as opposed to the species), although issues do arise in the case of stocks straddling international borders. For this reason, allocation of the harvestable surplus of Pacific whiting between the U.S. and Canada is subject to a negotiated agreement.

National Standard 4 states that conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishers, such allocation shall be (A) fair and equitable to all such fishers; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges. The proposed measures will not discriminate between residents of different states.

Management measures are developed through the Council process, which facilitates substantial participation by state representatives. Generally, state proposals are brought forward when alternatives are crafted and integrated to the degree practicable. Decisions about catch allocation between different sectors or gear groups are also part of this participatory process, and emphasis is placed on equitable division while ensuring conservation goals. None of the management measures in the alternatives would allocate specific shares or privileges to one individual or corporation.

National Standard 5 states that conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

Management measures in the groundfish fishery are not designed specifically for the purpose of efficient utilization. However, lower OY levels and other restrictions are likely to result in further fleet capacity reduction as fishing becomes economically unviable for more vessels. There is broad consensus that capacity reduction in some sectors is needed to rationalize fisheries. In response, the Council and NMFS implemented a fixed gear permit stacking program through Amendment 14 to the FMP. NMFS has also completed a trawl vessel buyback program to reduce the size of the limited entry fleet. Additionally, the Council has begun to explore the potential for individual quotas, in part, as a means of providing regulatory flexibility and economically viable fishing communities.

National Standard 6 states that conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

Management measures reflect differences in catch, and in particular bycatch of overfished species, among different fisheries. Because of the low harvest specifications for overfished species, management measures are proposed for nongroundfish fisheries to minimize bycatch of these species. Each alternative was evaluated in terms of the probable bycatch of overfished species, based on the proposed management measures. (See Chapter 2 and Chapter 4.) This allows comparison between the proposed OY and a judgement of whether management measures will constrain fisheries sufficiently.

National Standard 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

The alternatives do not explicitly address this standard. Generally, by coordinating management, monitoring, and enforcement activities between the three West Coast states duplication, and thus cost, is minimized. Necessary monitoring and enforcement programs, such as the use of fishery observers and implementation of VMS, increase management costs. But these efforts are necessary to effective management.

National Standard 8 states that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

This document evaluates the effects of the alternatives on fishing communities (see Sections 7.3.6, 7.4.6, and 7.5.6), and these effects were taken into account in choosing the preferred harvest specification and management measure alternatives. The preferred alternatives represent the Council's judgment of the best tradeoff between the need to conserve and rebuild fish stocks and the economic impacts of the necessary management measures. Generally, this tradeoff is resolved by structuring management measures to allow communities to access healthy, harvestable stocks while minimizing catch of overfished stocks.

National Standard 9 states that conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Minimizing bycatch, of all species and overfished species in particular, is an important component of the alternatives. GCAs are meant to keep fishing away from areas where overfished species are most abundant, and therefore reduce bycatch. Trip limits are structured to discourage directed and incidental catch of these species, but where bycatch is unavoidable, to allow some minimal retention. Integration of observer data into the management process allows more accurate estimates of bycatch rates, and thus *total catch estimates. Selective flatfish trawl gear has demonstrated reduce bycatch rates for several overfished rockfish species and is required north of 40 °10' N latitude shoreward of the RCA.*

National Standard 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

RCAs could affect safety if more vessels elect to fish seaward of the closed areas and are more exposed to bad weather conditions. Use of selective flatfish trawl gear north of 40 °10' N latitude has not only provided increased trip limits for target species, but has also decreased the size of the trawl RCAs thereby providing additional opportunity shoreward of the RCA and decreased incentive for smaller vessels to fish seaward of the RCA. For vessels electing to increase the amount of time fishing seaward of RCAs, implementing a VMS capable of sending distress calls could provide some mitigation. Although units with this capability have been approved for use, vessel owners are not required to purchase a unit with this capability. Also, by providing near real-time vessel position data, VMS could aid in search and rescue operations.

9.3 Other Applicable MSA Provisions

Harvest specifications are set based on targets established in overfished species rebuilding plans, which conform to Section 304(e)–Rebuild Overfished Fisheries. Rebuilding plans contain the elements required by Section 304(e)(4) and discussed in the NSGs (50 CFR 600.310).

Chapter 3 in this EIS constitutes an EFH assessment of the proposed action's impacts, as required by 50 CFR 600.920 (e)(3). NMFS prepared an EIS evaluating programmatic measures designed to identify and describe West Coast groundfish EFH, and minimize potential fishing impacts on West Coast groundfish EFH. The Council took final action amending the groundfish FMP to incorporate new EFH provisions in November 2005. NMFS partially approved the amendment in March 2006. Implementing regulations became effective in June 2006.

10.0 CROSS-CUTTING MANDATES

10.1 Other Federal Laws

10.1.1 Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) of 1972 requires all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The *Council-preferred Alternative* would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination has been submitted to the responsible state agencies for review under Section 307(c)(1) of the CZMA. The relationship of the groundfish FMP with the CZMA is discussed in Section 11.7.3 of the Groundfish FMP. The Groundfish FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs. The recommended action is consistent and within the scope of the actions contemplated under the framework FMP.

Under the CZMA, each state develops its own coastal zone management program which is then submitted for federal approval. This has resulted in programs which vary widely from one state to the next. Harvest specifications and management measures for 2007-2008 are not expected to affect any state's coastal management program.

10.1.2 Endangered Species Act

NMFS issued BOs under the ESA on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, December 15, 1999, and a supplemental BO on March, 11, 2006, pertaining to the effects of the groundfish fishery on Chinook salmon (Puget Sound, Snake River spring/summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central Valley spring, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal), chum salmon (Hood Canal summer, Columbia River), sockeye salmon (Snake River, Ozette Lake), and steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, northern California, southern California). During the 2000 Pacific whiting season, the whiting fisheries exceeded the Chinook bycatch amount specified in the Pacific whiting fishery BO (December 15, 1999) incidental take statement estimate of 11,000 fish, by approximately 500 fish. In the 2001 whiting season, however, the whiting fishery's Chinook bycatch was about 7,000 fish, which approximates the long-term average. The whiting fishery again exceeded the incidental take statement level of 11,000 fish in 2005 when almost 12,000 Chinook salmon were caught. In addition, new information became available about the bycatch of salmon in the groundfish bottom trawl sector. The March 11, 2006, supplemental BO evaluated this information and proposes measures to mitigate this bycatch. NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. The proposed action is within the scope of these consultations. Chapter 5 in this EIS evaluates the impacts of the proposed action on protected species.

10.1.3 Marine Mammal Protection Act

The MMPA of 1972 is the principle federal legislation that guides marine mammal species protection and conservation policy in the United States. Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of whales, dolphins, porpoise, as well as seals, sea lions, and fur seals;

while the U.S. Fish and Wildlife Service is responsible for walrus, sea otters, and the West Indian manatee.

Off the West Coast, the Steller sea lion (*Eumetopias jubatus*) eastern stock, Guadalupe fur seal (*Arctocephalus townsendi*), and Southern sea otter (*Enhydra lutris*) California stock are listed as threatened under the ESA. The sperm whale (*Physeter macrocephalus*) Washington, Oregon, and California stock, humpback whale (*Megaptera novaeangliae*) Washington, Oregon, and California - Mexico Stock, blue whale (*Balaenoptera musculus*) eastern north Pacific stock, and Fin whale (*Balaenoptera physalus*) Washington, Oregon, and California stock are listed as depleted under the MMPA. Any species listed as endangered or threatened under the ESA is automatically considered depleted under the MMPA.

The West Coast groundfish fisheries are considered a Category III fishery, indicating a remote likelihood of or no known serious injuries or mortalities to marine mammals, in the annual list of fisheries published in the *Federal Register*. Based on its Category III status, the incidental take of marine mammals in the West Coast groundfish fisheries does not significantly impact marine mammal stocks. The proposed action will affect the intensity, duration, and location of groundfish fisheries through implemented management measures. But these changes would not change the effects of the groundfish fisheries on marine mammals.

10.1.4 Migratory Bird Treaty Act

The MBTA of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished the populations of many native bird species. The MBTA states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The MBTA prohibits the directed take of seabirds, but the incidental take of seabirds does occur. The proposed action is unlikely to affect the incidental take of seabirds protected by the MBTA.

10.1.5 Paperwork Reduction Act

The proposed action, as implemented by any of the alternatives considered in this EIS, does not require collection-of-information subject to the Paperwork Reduction Act.

10.1.6 Regulatory Flexibility Act

The purpose of the RFA is to relieve small businesses, small organizations, and small governmental entities of burdensome regulations and record-keeping requirements. Major goals of the RFA are; (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action. An IRFA is conducted unless it is determined that an action will not have a "significant economic impact on a substantial number of small entities." The RFA requires that an IRFA include elements that are similar to those required by EO 12866 and NEPA. Therefore, the IRFA has been combined with the RIR and NEPA analyses. Section 10.3 (below) summarizes the analytical conclusions specific to the RFA and EO 12866.

10.2 Executive Orders

10.2.1 EO 12866 (Regulatory Impact Review)

EO 12866, Regulatory Planning and Review, was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. The EO covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. Section 1 of the EO deals with the regulatory philosophy and principles that are to guide agency development of regulations. It stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits across all regulatory alternatives. Based on this analysis, NMFS should choose those approaches that maximize net benefits to society, unless a statute requires another regulatory approach.

The RIR and IRFA determinations are part of the combined summary analysis in Section 11.3 of this document.

11.2.2 EO 12898 (Environmental Justice)

EO 12898 obligates federal agencies to identify and address "disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the United States" as part of any overall environmental impact analysis associated with an action. NOAA guidance, NAO 216-6, at §7.02, states that "consideration of EO 12898 should be specifically included in the NEPA documentation for decision-making purposes." Agencies should also encourage public participation—especially by affected communities—during scoping, as part of a broader strategy to address environmental justice issues.

The environmental justice analysis must first identify minority and low-income groups that live in the project area and may be affected by the action. Typically, census data are used to document the occurrence and distribution of these groups. Agencies should be cognizant of distinct cultural, social, economic, or occupational factors that could amplify the adverse effects of the proposed action. (For example, if a particular kind of fish is an important dietary component, fishery management actions affecting the availability, or price of that fish, could have a disproportionate effect.) In the case of Indian tribes, pertinent treaty or other special rights should be considered. Once communities have been identified and characterized, and potential adverse impacts of the alternatives are identified, the analysis must determine whether these impacts are disproportionate. Because of the context in which environmental justice is developed, health effects are usually considered, and three factors may be used in an evaluation: whether the effects are deemed significant, as the term is employed by NEPA; whether the rate or risk of exposure to the effect appreciably exceeds the rate for the general population or some other comparison group; and whether the group in question may be affected by cumulative or multiple sources of exposure. If disproportionately high adverse effects are identified, mitigation measures should be proposed. Community input into appropriate mitigation is encouraged.

Section 8.5 in Appendix A to the 2005–06 groundfish harvest specifications EIS describes a methodology, using 2000 U.S. Census data, to identify potential "communities of concern" because their populations have a lower income or a higher proportion of minorities than comparable communities in their region. Based on this information, but focusing on more isolated, rural coastal communities, Section 7.5.7 of this document discusses the potential effects of the proposed action on minority and low income populations. It should be noted that fishery participants make up a small proportion of the total population in these communities, and their demographic characteristics may be different from the community as a whole. However, information specific to fishery participants is not available. Furthermore, different segments of the fishery-involved population may differ demographically. For example, workers in fish processing plants may be more often from a minority population while deckhands may be more frequently low income in comparison to vessel owners.

Participation in decisions about the proposed action by communities that could experience disproportionately high and adverse impacts is another important principle of the EO. The Council offers a range of opportunities for participation by those affected by its actions and disseminates information to affected communities about its proposals and their effects through several channels. In addition to Council membership, which includes representatives from the fishing industries affected by Council action, the GAP, a Council advisory body, draws membership from fishing communities affected by the proposed action. While no special provisions are made for membership to include representatives from low income and minority populations, concerns about disproportionate effects to minority and low income populations could be voiced through this body or to the Council directly. Although Council meetings are not held in isolated coastal communities for logistical reasons, they are held in different places up and down the West Coast to increase accessability. In addition, fishery management agencies in Oregon and California sponsored public hearings in coastal communities to gain input on the proposed action. The comments were made available to the Council in advance of their decision to choose a preferred alternative.

The Council disseminates information about issues and actions through several media. Although not specifically targeted at low income and minority populations, these materials are intended for consumption by affected populations. Materials include a newsletter, describing business conducted at Council meetings, notices for meetings of all Council bodies, and fact sheets intended for the general reader. The Council maintains a postal and electronic mailing list to disseminate this information. The Council also maintains a website (www.pcouncil.org) providing information about the Council, its meetings, and decisions taken. Most of the documents produced by the Council, including NEPA documents, can be downloaded from the website.

10.2.3 EO 13132 (Federalism)

EO 13132, which revoked EO 12612, an earlier federalism EO, enumerates eight "fundamental federalism principles." The first of these principles states "Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people." In this spirit, the EO directs agencies to consider the implications of policies that may limit the scope of or preempt states' legal authority. Preemptive action having such "federalism implications" is subject to a consultation process with the states; such actions should not create unfunded mandates for the states; and any final rule published must be accompanied by a "federalism summary impact statement."

The Council process offers many opportunities for states (through their agencies, Council appointees, consultations, and meetings) to participate in the formulation of management measures. This process encourages states to institute complementary measures to manage fisheries under their jurisdiction that may affect federally-managed stocks.

The proposed action does not have federalism implications subject to EO 13132.

10.2.4 EO 13175 (Consultation and Coordination With Indian Tribal Government)

EO 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

The Secretary recognizes the sovereign status and co-manager role of Indian tribes over shared federal and tribal fishery resources. At Section 302(b)(5), the Magnuson-Stevens Act reserves a seat on the Council for a representative of an Indian tribe with federally-recognized fishing rights from California, Oregon, Washington, or Idaho.

The U.S. government formally recognizes the four Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish. In general terms, the quantification of those rights is 50% of the harvestable surplus of groundfish available in the tribes' U and A fishing areas (described at 50 CFR 660.324). Each of the treaty tribes has the discretion to administer their fisheries and to establish their own policies to achieve program objectives.

Accordingly, harvest specifications and management measures for 2007-2008 have been developed in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus.

10.2.5 EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds)

EO 13186 supplements the MBTA (above) by requiring federal agencies to work with the USFWS to develop memoranda of agreement to conserve migratory birds. NMFS is in the process of implementing a memorandum of understanding. The protocols developed by this consultation will guide agency regulatory actions and policy decisions in order to address this conservation goal. The EO also directs agencies to evaluate the effects of their actions on migratory birds in environmental documents prepared pursuant to the NEPA.

The FEIS for the 2005-2006 groundfish harvest specifications and management measures evaluated impacts to seabirds and concluded that the proposed action will not significantly impact seabirds. There is no new information to indicate that the current proposed action would result in greater impacts to seabirds and the previous evaluation is incorporated by reference.

10.3 Regulatory Impact Review and Regulatory Flexibility Analysis

In order to comply with EO 12866 and the RFA, this document also serves as an RIR and an IRFA. A summary of these analyses is presented below.

10.3.1 EO 12866 (Regulatory Impact Review)

EO 12866, Regulatory Planning and Review, was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. The EO covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. Section 1 of the EO deals with the regulatory philosophy and principles that are to guide agency development of regulations. It stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits across all regulatory alternatives. Based on this analysis, NMFS should choose those approaches that maximize net benefits to society, unless a statute requires another regulatory approach.

The regulatory principles in EO 12866 emphasize careful identification of the problem to be addressed. The agency is to identify and assess alternatives to direct regulation, including economic incentives such as user fees or marketable permits, to encourage the desired behavior. Each agency is to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only after reasoned determination the benefits of the intended regulation justify the costs. In reaching its decision agency must use the best reasonably obtainable information, including scientific, technical and economic data, about the need for and consequences of the intended regulation.

NMFS requires the preparation of an RIR for all regulatory actions of public interest; implementation of rebuilding plans includes the publication of strategic rebuilding parameters in federal regulations. The RIR provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure the regulatory agency systematically and comprehensively considers all available alternatives, so the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of EO 12866.

The RIR analysis and an environmental analyses required by NEPA have many common elements and they have been combined in this document. The following table shows where the elements of an RIR, as required by EO 12866, are located.

Required RIR Elements	Corresponding Sections
Description of management objectives	Sections 1.2 & 1.3
Description of the fishery[a/]	Chapter 7
Statement of the problem	Section 1.2.2
Description of each alternative considered in the analysis	Chapter 2
An analysis of the expected economic effects of each alternative	Chapter 7

a/ In addition to the information in this document, basic economic information is provided annually in the Council's Stock Assessment and Fishery Evaluation document.

The RIR is designed to determine whether the proposed actions could be considered "significant regulatory actions" according to EO 12866. The EO 12866 test requirements used to assess whether or not an action would be a "significant regulatory action" and the expected outcomes of the proposed management alternative are discussed below. A regulatory program is "economically significant" if it is likely to result in the following effects:

1.a. Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities.

1.b. Present a risk to long term productivity:

2. Create a serious inconsistency or otherwise interfere with action taken or planned by another agency.

3. Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof.

4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this EO.

10.3.2 Impacts on Small Entities (Regulatory Flexibility Act, RFA)

The RFA requires government agencies to assess the effects that regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those effects. A fish-harvesting business is considered a "small" business by the Small Business Administration (SBA) if it has annual receipts not in excess of $3.5 million. For related fish-processing businesses, a small business is one that employs 500 or fewer persons. For wholesale businesses, a small business is one that employs not more than 100 people. For marinas and charter/party boats, a small business is one with annual receipts not in excess of $5 million.

The data available for this analysis are based on data sets that have vessel and buyer/processor identifiers. The commercial data are from the PacFIN data system, and the recreational data were provided by the states. The vessel and processor counts are based on unique vessel and buyer/processor identifiers. However, it is known that in many cases a single firm may own more than one vessel, or a buyer/processing facility may include more than one profit center. Therefore, the counts should be considered upper bound estimates. Additionally, businesses owning vessels and/or buyers and processors may have revenue from fisheries in other geographic areas, such as Alaska, or from nonfishing activities. Therefore, it is likely that when all operations of a firm are aggregated, some of the small entities identified here are actually larger than indicated.

Council-preferred Alternative

Seafood Harvesters -

Buyers/Processors -

Recreational Fishery

Section 603 (b) of the RFA identifies the elements that should be included in the IRFA. These are bulleted below, followed by information that addresses each element.

- A description of the reasons why action by the agency is being considered.

The purpose and need for the proposed action are discussed in Section 1.2.

- A succinct statement of the objectives of, and legal basis for, the proposed rule.

The description of purpose and need in Section 1.2 also outlines the objectives of the proposed action. The introductory paragraph in Chapter 1 and Section 1.3, background to the purpose and need, provide information on the legal basis for the proposed action (proposed rule).

- A description and, where feasible, an estimate of the number of small entities to which the proposed rule will apply.

- A description of the projected reporting, record-keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirements of the report or record.

There are no new reporting or record-keeping requirements that are proposed as part of this action.

- An identification, to the extent practicable, of all relevant federal rules, which may duplicate, overlap, or conflict with the proposed rule.

No federal rules have been identified that duplicate, overlap, or conflict with the alternatives. Public comment is hereby solicited, identifying such rules.

- A description of any significant alternatives to the proposed rule that accomplish the stated objectives that would minimize any significant economic impact of the proposed rule on small entities.

This EIS includes a range of alternatives, which were considered by the Council.

11.0 LIST OF PREPARERS

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Groundfish Management Team

The Groundfish Management Team worked with the Council to develop the details of the alternatives and provided catch and bycatch projections. State and tribal representatives put forward proposals for allocations and management measures. Additional contributions are noted below, as appropriate.

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12.0 AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THIS STATEMENT WERE SENT

The Council makes both the DEIS and FEIS available on its website, so anyone with computer access may download an electronic copy. Electronic copies on CD-ROM and paper copies are made available upon request. The Council distributes a notice of availability for the DEIS and FEIS through its electronic mailing list, which include state and federal agencies, tribes, and individuals. Copies of the FEIS are sent to anyone who comments on the DEIS. In addition, NMFS distributes copies of the DEIS to the following agencies:

Department of Interior
Department of State
U.S. Coast Guard, Commander Pacific Area
Marine Mammal Commission
Pacific States Marine Fisheries Commission
Washington Coastal Zone Management Program, Shoreline Environmental Assistance, Department of Ecology, Washington State
Ocean-Coastal Management Program, Department of Land Conservation and Development, State of Oregon
California Coastal Commission

13.0 ACRONYMS AND GLOSSARY

Acronym	Definition
ABC	Acceptable biological catch. See below.
acceptable biological catch	The ABC is a scientific calculation of the sustainable harvest level of a fishery and is used to set the upper limit of the annual total allowable catch. It is calculated by applying the estimated (or proxy) harvest rate that produces maximum sustainable yield to the estimated exploitable stock biomass (the portion of the fish population that can be harvested).
ADFG	Alaska Department of Fish and Game
AIS	Automated Information System
ALD	Angler license database
allocation	Distribution of fishing opportunity among user groups or individuals. Shares are sometimes based on historic harvest amounts.
alternatives	In the context of an environmental impact statement for annual fisheries management measures, alternatives are different suites of optimum yields and management measures that could be used to manage fisheries.
anadromous	Fish that spend their adult life in the sea, but swim upriver to freshwater spawning grounds in order to reproduce.
angler	A person catching fish or shellfish with no intent to sell; includes people releasing the catch.
annuli	Annual variations in the pattern of growth rings on fish scales or otoliths (ear bones).
APA	Administrative Procedures Act
$B_{25\%}$	25% of unfished biomass (size of fish stock without fishing). For groundfish, this is the threshold for being designated as overfished.
$B_{40\%}$	40% of unfished biomass (size of fish stock without fishing). This is the Council's threshold for declaring a stock rebuilt, or the size of the stock estimated to produce maximum sustainable yield. This is also referred to as B_{MSY}.
BA	Biological assessment. See below.
barotrauma	Physical trauma or injury to a fish due to pressure change. When a fish is rapidly brought from deep water to the surface, the drop in pressure can cause a variety of physical problems, such as severe expansion of the swim bladder and gas bubbles in the blood.
bathymetry	The science of measuring the ocean's depth.
Bathypelagic Zone	The zone of the ocean that extends from 1,000 to 4,000 meters below the ocean surface.
BB	Beach and Bank

Acronym	Definition
benthic	Refers to organisms that live on or in the ocean floor.
best available science	The term “best available science” comes from the second National Standard listed in the Magnuson-Stevens Act and is the informational standard mandated for decision making.
bioaccumulation	The build-up over time of substances (like metals) that cannot be excreted by an organism.
biological assessment (BA)	An assessment conducted as part of the Endangered Species Act process.
Biological Opinion (BO)	A scientific assessment issued by the National Marine Fisheries Service or U.S. Fish and Wildlife Service, as required by the Endangered Species Act for listed species. Determines the likelihood of an action to jeopardize the existence of a species listed under the Endangered Species Act.
biomass	The total weight of a stock of fish.
BiOp	Biological opinion. See above.
biota	Refers to any and all living organisms and the ecosystems in which they exist.
BLM	Bureau of Land Management. Administers 261 million acres of public lands, mainly in the West.
blocked quota shares	Quota shares that must be transferred together, and cannot be divided.
BMP	Best Management Practices
B_{MSY}	The biomass that allows maximum sustainable yield to be taken. Also see $B_{40\%}$.
BO	Biological opinion. See above.
B_o	Unfished biomass; the estimated size of a fish stock in the absence of fishing.
BOR	U.S. Bureau of Reclamation. Responsible for managing water distribution in the West.
BPA	Bonneville Power Administration. BPA markets electricity from 31 federally-owned dams in the Columbia River basin.
BRD	Bycatch reduction device. See below.
BSAI	Bering Sea Aleutian Islands
bycatch	Fish that are captured in a fishery, but that are discarded (returned to the sea) rather than being sold, kept for personal use, or donated to a charitable organization. Bycatch plus landed catch equals the total catch or total estimated fishing mortality.
bycatch reduction device	Devices (such as finfish excluders) incorporated info fishing gears designed to reduce the take of non-target species.

Acronym	Definition
C&S	Ceremonial and subsistence. See below.
CA	California
CAGEAN	Catch-at-age analysis. An analysis used to reconstruct the population history of long-lived fish stocks. They provide an estimate of the current “exploitable biomass” (the part of the population that can be fished) upon which the harvest rate is based.
CalCOFI	California Cooperative Oceanic Fisheries Investigations
California bight	The region of concave coastline off Southern California between the headland at Point Conception and the U.S./Mexican border, and encompassing various islands, shallow banks, basins, and troughs extending from the coast roughly 200 km offshore.
California Rockfish Conservation Area	The California Rockfish Conservation Area (CRCA) is defined as (1) ocean waters 20 fm to 250 fm between Cape Mendocino and Point Reyes and 20 fm to 150 fm between Point Reyes and the U.S./Mexico Border, and (2) the Cowcod Conservation Areas. The purpose of the CRCA is to regulate all gear types that have a potentially significant affect on rebuilding of overfished rockfish species south of Cape Mendocino.
CAM	Coho Assessment Model
CANSAR-TAM	Catch-at-age Analysis for Sardine - Two Area Model (see CAGEAN)
catch per unit of effort	The quantity of fish caught (in number or weight) with one standard unit of fishing effort. For example, the number of fish taken per 1,000 hooks per day, or the weight of fish, in tons, taken per hour of trawling. CPUE is often considered an index of fish biomass (or abundance). Sometimes referred to as catch rate. CPUE may be used as a measure of economic efficiency of fishing as well as an index of fish abundance.
CBFWA	Columbia Basin Fish and Wildlife Authority
CCA	Cowcod Conservation Area(s). See below.
CDFG	California Department of Fish and Game
CDQ	Community development quota
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
ceremonial and subsistence	A harvest category specific to native American tribes.
CERT	Community Economic Revitalization Teams
cetaceans	Marine mammals of the order Cetacea. Includes whales, dolphins and porpoises.

Acronym	Definition
CFGC	California Fish and Game Commission
CFR	Code of Federal Regulations. See below.
CFZ	Contiguous fishery zone. The area from 3-12 miles offshore.
Channel Islands National Marine Sanctuary	A 1,252-square-nautical-mile area of the Santa Barbara Channel designated as a marine sanctuary in 1980. It encompasses an area out to six nautical miles around the islands of San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara. CINMS is one of 13 National Marine Sanctuaries around the country.
CIE	Committee of independent experts
CINMS	Channel Islands National Marine Sanctuary. See above.
CITES	Convention of International Trade in Endangered Species
cm	Centimeter
coastal pelagic species	Coastal pelagic species are schooling fish, not associated with the ocean bottom, that migrate in coastal waters. They usually eat plankton and are the main food source for higher level predators such as tuna, salmon, most groundfish, and humans. Examples are herring, squid, anchovy, sardine, and mackerel.
Coastal Zone Management Act	The main objective of the CZMA is to encourage and assist states in developing coastal zone management programs, to coordinate state activities, and to safeguard the regional and national interests in the coastal zone. It requires that any federal activity (including fishery management regulations) directly affecting the coastal zone of a state be consistent with that state's approved coastal zone management program, since activities that take place beyond the territorial sea may affect the coastal zone.
Code of Federal Regulations	A codification of the regulations published in the *Federal Register* by the executive departments and agencies of the federal government. The CFR is divided into 50 titles that represent broad areas subject to federal regulation. Title 50 contains wildlife and fisheries regulations.

Acronym	Definition
coded-wire tag	Coded-wire tags are small pieces of stainless steel wire that are injected into the snouts of juvenile salmon and steelhead. Each tag is etched with a binary code that identifies its release group.
cod-end	The end of a trawl net, which retains the catch.
COE	(U.S. Army) Corps of Engineers. Among other things, the COE manages hydropower facilities, conducts dredging operations, and builds breakwaters and jetties.
cohort	In a stock, a group of fish born during the same time period.
cohort replacement rate	The rate at which each subsequent cohort, or generation, replaces the previous one.
commercial fishing	Fishing in which the fish harvested, either whole or in part, are intended to enter commerce through sale, barter, or trade.
COMPASS	Communication Partnership for Science and the Sea
co-occurring stocks	Different stocks of fish that swim or school near one another and may be caught together.
COP	Council Operating Procedures
Council	Pacific Fishery Management Council
Cowcod Conservation Area(s)	Two areas located in the Southern California Bight southwest of Santa Monica to the California/Mexico border that encompass roughly 4,300 square nautical miles of habitat where the highest densities of cowcod occur. These areas are closed to bottom fishing in order to rebuild the cowcod stock.
CPFD	Catch per fishing day
CPFV	Commercial passenger fishing vessel (charter boat)
CPS	Coastal pelagic species. See above.
CPUE	Catch per unit of effort. See above.
CRCA	California Rockfish Conservation Area. See above.
CRFD	Coastal Fisheries Resources Division
CRFS	California Recreational Fisheries Survey
CRITFC	Columbia River Inter-Tribal Fish Commission
CRP	Conservation Reserve Program
CRR	Cohort replacement rate. See above.
CRTAC	Columbia River Technical Advisory Committee

Acronym	Definition
CSP	Halibut Catch Sharing Plan
cumulative limit	The total allowable amount of a species or species group, by weight, that a vessel may take and retain, possess, or land during a period of time. Fishers may take as many landings of a species or species complex as they like as long as they do not exceed the cumulative limit that applies to the vessel or permit during the designated period.
cumulative limit stacking	The association of cumulative limits with permits, rather than with vessels, allowing a vessel with multiple limited entry permits to harvest multiple cumulative limits. Also known as “permit stacking.”
CV	Coefficient of variation
CWT	Coded-wire tag. See above.
CZMA	Coastal Zone Management Act. See above.
DAH	Domestic annual harvest. See below.
DAP	Domestic annual processing. See below.
DBCA	Darkblotched (rockfish) Conservation Area
DEIS	Draft Environmental Impact Statement (see EIS, NEPA)
demersal	Living near, and depending on, the sea floor. For example, cods, groupers, and halibut are demersal. (Pronounced “deMERsal”).
density dependence	The degree to which spawning biomass effects recruitment of a fish stock.
DEPM	Daily egg production method
derby fishery	A fishery of brief duration during which fishers race to take as much catch as they can before the fishery closes.
DFO	(Canada) Department of Fisheries and Oceans
DFOP	Detailed Fishery Operating Plan
DFW	Department of Fish and Wildlife
DGN	Drift gillnet
DOC	Department of Commerce. Parent organization of the National Marine Fisheries Service.
DOI	Department of Interior
DOJ	Department of Justice. DOJ attorneys represent the Secretary of Commerce in litigation on fishery management plans.
DOM	Domestic catch
domestic annual harvest	The domestic annual fishing capacity, modified by other factors (such as economic factors), which will determine estimates of what the fleets will harvest.

Acronym	Definition
domestic annual processing	The amount that will be domestically processed, based not only on physical capacity, but on a demonstrated intent, and the effects of domestic harvesting, markets, and other fisheries.
DOS	Department of State
downwelling	The process whereby prevailing seasonal winds create surface currents that cause surface water to sink, bringing nutrient-poor ocean surface water into an area.
DTL	Daily-trip-limit
DTS	Dover sole, thornyhead, and trawl-caught sablefish complex
EA	Environmental assessment (see NEPA, EIS). See below.
EC	Enforcement Consultants. See below.
ED	Environmental Defense (formerly the Environmental Defense Fund)
ED	Executive Director
EDCP	Enhanced Data Collection Project
EDF	Environmental Defense Fund
EDM	Estimated discard mortality. See below.
EEZ	Exclusive Economic Zone. See below.
EFH	Essential fish habitat. See below.
EFIN	Economic Fishery Information Network, administered by the Pacific States Marine Fisheries Commission.
EFP	Exempted fishing permit. See below.
EIA	Environmental impact assessment. A set of activities designed to identify and predict the impacts of proposed action on the environment, and on human health and well being, and to interpret and communicate information about the impacts, including mitigation measures likely to eliminate the risks.
EIR	Environmental impact review
EIS	Environmental impact statement. See below.

Acronym	Definition
El Niño Southern Oscillation	Abnormally warm ocean climate conditions, which in some years affect the eastern coast of Latin America (centered on Peru) often around Christmas time. The anomaly is accompanied by dramatic changes in species abundance and distribution, higher local rainfall and flooding, and massive deaths of fish and their predators. Many other climactic anomalies around the world are attributed to consequences of *El Niño*.
Endangered Species Act	An act of federal law that provides for the conservation of endangered and threatened species of fish, wildlife, and plants. When preparing fishery management plans, councils are required to consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service to determine whether the fishing under a fishery management plan is likely to jeopardize the continued existence of an ESA-listed species or to result in harm to its critical habitat.
endorsement	A designation on a limited entry permit that authorizes the use of the permit for a particular gear, length of vessel, or in a particular segment of the fishery.
Enforcement Consultants	A Council committee that provides advice on enforcement of fishery regulations.
ENSO	*El Niño* Southern Oscillation. See above.
environmental assessment	As part of the National Environmental Policy Act (NEPA) process, an EA is a concise public document that provides evidence and analysis for determining whether to prepare an environmental impact statement (EIS) or a Finding of No Significant Impact.
Environmental impact statement	As part of the National Environmental Policy Act (NEPA) process, an EIS is an analysis of the expected impacts resulting from the implementation of a fisheries management or development plan (or some other proposed action) on the environment. EISs are required for all fishery management plans as well as significant amendments to existing plans. The purpose of an EIS is to ensure the fishery management plan gives appropriate consideration to environmental values in order to prevent harm to the environment.
EO	Executive Order
EO 12866	A Federal executive order that, among other things, requires agencies to assess the economic costs and benefits of all regulatory proposals and complete a Regulatory Impact Analysis (RIA) that describes the costs and benefits of the proposed rule and alternative approaches, and justifies the chosen approach. See RIR.
EPA	Environmental Protection Agency
EPO	Eastern Pacific Ocean
equilibrium yield	The harvest that would maintain a stock at its current level, apart from the effects of environmental conditions.

Acronym	Definition
ESA	Endangered Species Act. See above.
escapement	The number or proportion of fish surviving (escaping from) a given fishery at the end of the fishing season and reaching the spawning grounds. Term generally used for salmon management.
essential fish habitat	Those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity.
Estimated discard mortality	Estimates of discards can be made in a variety of ways, including samples from observers and logbook records. Fish (or parts of fish) can be discarded for a variety of reasons such as having physical damage, being a non-target species for the trip, and compliance with management regulations like minimum size limits or quotas.
ESU	Evolutionarily significant unit
ETP	Eastern tropical Pacific
evolutionarily significant unit	An Evolutionarily Significant Unit or "ESU" is a distinctive group of Pacific salmon, steelhead, or sea-run cutthroat trout that is uniquely adapted to a particular area or environment and cannot be replaced.
Exclusive Economic Zone	A zone under national jurisdiction (up to 200 nautical miles wide) declared in line with the provisions of the 1982 United Nations Convention of the Law of the Sea, within which the coastal State has the right to explore and exploit, and the responsibility to conserve and manage, the living and non-living resources.
exempted fishing permit	A permit issued by National Marine Fisheries Service that allows exemptions from some regulations in order to study the effectiveness, bycatch rate, or other aspects of an experimental fishing gear. Previously known as an "experimental fishing permit."
exploitable biomass	The biomass that is available to a unit of fishing effort. Defined as the sum of the population biomass at age (calculated as the mean within the fishing year) multiplied by the age-specific availability to the fishery. Exploitable biomass is equivalent to the catch biomass divided by the instantaneous fishing mortality rate.
EY	Equilibrium yield. See above.

Acronym	Definition
F	The instantaneous rate of fishing mortality. The term "fishing mortality rate" is a technical fishery science term that is often misunderstood. It refers to the rate at which animals are removed from the stock by fishing. The fishing mortality rate can be confusing because it is an "instantaenous" rate that is useful in mathematical calculations, but is not easily translated into the more easily understood concept of "percent annual removal."
F=0	Fishing mortality equals zero (no fishing).
FAD	Fish aggregating device. See below.
FAO	Food & Agriculture Organization of the United Nations
fathom	Used chiefly in measuring marine depth. A fathom equals six feet.
FCRA	Federal Credit Reform Act
FCZ	Fishery Conservation Zone. The area over which the U.S. asserts exclusive fishery management authority. The FCZ extends from the seaward boundary of the coastal states' territorial seas to 200 nautical miles from the baseline where the territorial sea is measured (roughly, 3 to 200 miles offshore). Similar to the EEZ, or Exclusive Economic Zone.
FEAM	Fishery economic assessment model. See below.
Fecundity	The potential to produce offspring.
Federal Register	The Federal Register is the official daily publication for Rules, Proposed Rules, and Notices of Federal agencies and organizations, as well as Executive Orders and other Presidential documents. Fisheries regulations are not considered final until they are published in the Federal Register.
FEIS	Final Environmental Impact Statement (see EIS, NEPA).
FERC	Federal Energy Regulatory Commission. Regulates hydropower operations.
FFA	(South Pacific) Forum Fishery Agency
Finding of no significant impact	As part of the National Environmental Policy Act (NEPA) process, a finding of no significant impact (FONSI) is a document that explains why an action that is not otherwise excluded from the NEPA process, and for which an environmental impact statement (EIS) will not be prepared, will not have a significant effect on the human environment.
Fish aggregating device	Artificial or natural floating objects placed on the ocean surface, often anchored to the bottom, to attract several schooling fish species underneath, thus increasing their catchability.

Acronym	Definition
Fish stock	A population of a species of fish from which catches are taken in a fishery. Use of the term “fish stock” usually implies that the particular population is more or less isolated from other stocks of the same species, and hence self-sustaining.
Fishery economic assessment model	FEAM uses historical landings data, information on industry cost and margin structure (vessels and processors), and income multipliers generated by IMPLAN to produce estimates of “regionalized” local income impact after deducting for leakage of payments to non-residents and to non-local suppliers, wholesalers, and manufactures.
Fishery management council	A fisheries management body established by the Magnuson-Stevens Act to manage fishery resources in designated regions of the United States. Membership varies in size depending on the number of states involved. There are eight regional Councils, including the Pacific Council.
Fishery management plan	A plan, and its amendments, that contains measures for conserving and managing specific fisheries and fish stocks.
Fishery management unit	The species or stocks of fish managed under a fishery management plan.
Fishing	The catching, taking, or harvesting of fish; the attempted catching, taking, or harvesting of fish; any other activity that can reasonably be expected to result in the catching, taking, or harvesting of fish; any operations at sea in support of, or in preparation for, any of these activities. This term does not include any activity by a vessel conducting authorized scientific research.
Fishing community	A community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs. Includes fishing vessel owners, fishing families, operators, crew, recreational fishers, fish processors, gear suppliers, and others in the community who depend on fishing.
Fixed gear	Fishing gear that is stationary after it is deployed (unlike trawl or troll gear which is moving when it is actively fishing). Within the context of the groundfish limited entry fleet, “fixed gear” means longline and fishpot (trap) gear. Within the context of the entire groundfish fishery, fixed gear includes longline, fishpot, and any other gear that is anchored at least at one end.
FL	Fork length. See below.
Fm	Fathom (6 feet)
FMA	Fishery management area
FMC	Fishery Management Council. See above.
FMP	Fishery management plan. See above.

Acronym	Definition
F_{MSY}	The fishing mortality rate that maximizes catch biomass in the long term.
FMU	Fishery management unit
FONSI	Finding of no significant impact. See above.
Footrope	The rope along the bottom of a trawl net's opening. Small footropes can get caught or tangled in rocky reef areas, so regulations that require small footropes protect these rocky areas by encouraging skippers to fish elsewhere.
Fork length	A measurement used frequently for fish length when the tail has a fork shape. Projected straight distance between the tip of the fish and the fork of the tail.
FR	Federal Register. See above.
FRFA	Final Regulatory Flexibility Analysis. The FRFA includes all the information from the initial regulatory flexibility analysis. Additionally, it provides a summary of significant issues raised by the public, a statement of any changes made in the proposed rule as a result of such comments, and a description of steps taken to minimize the significant adverse economic impact on small entities consistent with stated objectives.
FRO	Fishery Resource Office
FTE	Full time employee
FWS	U.S. Fish and Wildlife Service
$F_{X\%}$	The rate of fishing mortality that will reduce female spawning biomass per recruit to x percent of its unfished level. F100% is zero, and F35% is a reasonable proxy for FMSY. (All figures after "F" should be subscript.)
GAC	Groundfish Allocation Committee
GAO	General Accounting Office
GAP	Groundfish Advisory Subpanel. See below.
GCA	Groundfish Conservation Area
GCG	Gene Conservation Group. A genetically distinct group within a species that forms when a group does not mix with other populations of the same species.
GDOP	Groundfish Disaster Outreach Program (Oregon Sea Grant)
GDP	Gross Domestic Product
GF	Groundfish
GFNMS	Gulf of the Farallones National Marine Sanctuary
GFSP	Groundfish Fishery Strategic Plan

Acronym	Definition
GIFA	Governing International Fishery Agreement. Foreign vessels fishing within the fishery conservation zone must have a permit issued by the Secretary of Commerce. In order to receive a permit, each foreign nation must enter into a formal GIFA which binds them to comply with U.S. regulations and allows for vessel inspection and enforcement of regulations.
GIPC	Groundfish Information Policy Committee
GIS	Geographic Information System
GLM	Generalized Linear Models
GMMC	Ad Hoc Groundfish Multi-Year Management Committee
GMT	Groundfish Management Team. See below.
GPS	Global Positioning System
Groundfish Advisory Subpanel	The Council established the GAP to obtain the input of the people most affected by, or interested in, the management of the groundfish fishery. This advisory body is made up of representatives with recreational, trawl, fixed gear, open access, tribal, environmental, and processor interests. Their advice is solicited when preparing fishery management plans, reviewing plans before sending them to the Secretary, reviewing the effectiveness of plans once they are in operation, and developing annual and inseason management.
Groundfish Management Team	Groundfish management plans and annual and inseason management recommendations are prepared by the Council's GMT, which consists of scientists and managers with specific technical knowledge of the groundfish fishery.
GSA	General Services Administration
GSI	Genetic stock identification
Habitat areas of particular concern	Subsets of essential fish habitat (see EFH) containing particularly sensitive or vulnerable habitats that serve an important ecological function, are particularly sensitive to human-induced environmental degradation, are particularly stressed by human development activities, or comprise a rare habitat type.

Acronym	Definition
Habitat TRC	Ad Hoc Groundfish Habitat Technical Review Committee
HAPC	Habitat areas of particular concern. See above.
Harvest guideline(s)	A numerical harvest level that is a general objective, but not a quota. Attainment of a harvest guideline does not require a management response, but it does prompt review of the fishery.
Harvest specifications	The detailed regulations that make up management measures – for example, trawl footrope size, depth limits, net mesh size, etc.
HAS	Halibut Advisory Subpanel
HC	Habitat Committee
HCP	Habitat Conservation Plan
HG	Harvest guideline(s). See above.
High seas	All waters beyond the EEZ (3-200 mile zone) of the United States and beyond any foreign nation's EEZ.
Highly migratory species	In the Council context, highly migratory species in the Pacific Ocean include species managed under the HMS Fishery Management Plan: tunas, sharks, billfish/swordfish, and dorado or dolphinfish.
HMG	Halibut Managers Group
HMS	Highly migratory species. See above.
HMS FMP	Highly Migratory Species Fishery Management Plan. This is the fishery management plan (and its subsequent revisions) for the Washington, Oregon, and California Highly Migratory Species Fisheries developed by the PFMC and approved by the Secretary of Commerce.
HMSAS	Highly Migratory Species Advisory Subpanel
HMSMT	Highly Migratory Species Management Team
HMSPDT	Highly Migratory Species Plan Development Team
HRM	Harvest Rate Model
HSFCA	High Seas Fisheries Compliance Act
IATTC	Inter-American Tropical Tuna Commission
IBQ	Individual bycatch quota. IBQs are used to control the catch of prohibited species.
ICA	Initial catch allowance (related to individual quotas)
ICB	Information Collection Budget
ICCAT	International Convention for the Conservation of Atlantic Tunas
ICES	International Convention for the Exploration of the Sea
IFQ	Individual fishing quota. See below.

Acronym	Definition
IGH	Iron Gate Hatchery
IMPLAN	IMpact Analysis for PLANning - a regional economic impact model
Incidental catch or incidental species	Species caught when fishing for the primary purpose of catching a different species.
Incidental take	The "take" of protected species (such as listed salmon, marine mammals, sea turtles, or sea birds) during fishing. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct.
Individual transferable (or tradeable) quota	A type of quota (a part of a total allowable catch) allocated to individual fishermen or vessel owners and which can be transferred (sold, leased) to others.
Initial regulatory flexibility analysis	An analysis required by the Regulatory Flexibility Act.
INMARSAT	International Marine Satellite
INPFC	International North Pacific Fishery Commission. See below.
Inseason adjustments	Regulatory changes that affect an ongoing fishery.
International North Pacific Fishery Commission	International North Pacific Fisheries Commission (INPFC) areas are used to define fishing areas. The INPFC was established in 1952 and dissolved in 1993, but the areas defined by the Commission are still commonly used in marine fisheries management.
International Pacific Halibut Commission	A Commission responsible for studying Pacific halibut stocks and the halibut fishery. The IPHC makes proposals to the U.S. and Canada concerning the regulation of the halibut fishery.
Invertebrate	An animal, such as a mollusk, with no spinal column
IPA	Intergovernmental Personnel Act. An IPA Agreement permits the temporary assignment of personnel between Federal agencies, state, local, and Indian tribal governments, colleges and universities, and certain other organizations.
IPHC	International Pacific Halibut Commission. See above.
IPOA	International Plan of Action
IPQ	Individual processing quota
IQ	Individual quota
IRFA	Initial regulatory flexibility analysis. See above.
ISC	Interim Scientific Committee
ITQ	Individual Transferable (or Tradable) Quota. See above.
JV	Joint Venture

Acronym	Definition
KFMC	Klamath Fishery Management Council
kg	kilogram
KMZ	Klamath management zone (ocean zone between Humbug Mountain and Horse Mountain where management emphasis is on Klamath River fall chinook)
LCN	Lingcod - North
LCS	Lingcod - South
LE	Limited entry fishery. See below.
Length requirement	The requirement that specifies that permits may not be registered for use with vessels more than five feet longer (in overall length) than the length endorsed on the permit.
Limited entry fishery	A fishery for which a fixed number of permits have been issued in order to limit participation.
Local depletion	Local depletion occurs when localized catches take more fish than can be replaced either locally or through fish migrating into the catch area. Local depletion can occur apart from the status of the overall stock, and can be greater than decreases in the entire stock.
LOS	Law of the Sea
M	Instantaneous rate of natural mortality (as opposed to F, fishing mortality)
m	Meter(s)
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act. See below.
Magnuson-Stevens Fishery Conservation and Management Act	The MSFCMA, sometimes known as the "Magnuson-Stevens Act," established the 200-mile fishery conservation zone, the regional fishery management council system, and other provisions of U.S. marine fishery law.
Marine Mammal Protection Act	The MMPA prohibits the harvest or harassment of marine mammals, although permits for incidental take of marine mammals while commercial fishing may be issued subject to regulation. (See "incidental take" for a definition of "take").
Marine Recreational Fisheries Statistical Survey	A national survey conducted by National Marine Fisheries Service to estimate the impact of recreational fishing on marine resources.

Acronym	Definition
MARPOL	International Convention for the Prevention of Pollution from Ships
MAX CAT	Maximum Allowable Catch
Maximum fishing mortality threshold	A limit identified in the National Standard Guidelines. A fishing mortality rate above this threshold constitutes overfishing.
Maximum sustainable yield	An estimate of the largest average annual catch or yield that can be continuously taken over a long period from a stock under prevailing ecological and environmental conditions. Since MSY is a long-term average, it need not be specified annually, but may be reassessed periodically based on the best scientific information available.
mb	megabyte
MBTA	Migratory Bird Treaty Act
MCB	Mid-Columbia River brights (bright hatchery fall chinook released in the Columbia River downstream from McNary Dam.)
MCMC	Monte Carlo Markov Chain (analysis)
mean generation time	A measure of the time required for a female to produce a reproductively-active female offspring.
MERRP	Marine Ecological Reserves Research Program
MFCMA	Magnuson Fishery Conservation and Management Act. The Fishery Conservation and Management Act was renamed the "Magnuson Fishery Conservation and Management Act" in 1980. The MFCMA established the 200-mile fishery conservation zone and the regional fishery management council system.
MFMT	Maximum fishing mortality threshold. See above.
MHHW	Mean higher high water level (high tide line)
MHLC	Multilateral High-Level Conference
Minimum stock size threshold	A threshold biomass used to determine if a stock is overfished. The Council proxy for MSST is B25%.

Acronym	Definition
Mixed stock exception	In “mixed-stock complexes,” many species of fish swim together and are caught together. This becomes a problem when some of these stocks are healthy and some are overfished, because even a sustainable harvest of the healthy stocks can harm the depleted stock. In order to avoid having to shut down all fisheries to protect one particular overfished stock, the national standard guidelines allow a “mixed-stock” exception to the “overfished” definition. This would allow higher catches of some overfished species than ordinarily allowed in order to avoid severe hardship to fishing communities.
MLR	Minimum landing requirement
mm	Millimeter
MM	Man made
MMPA	Marine Mammal Protection Act. See above.
MOA	Memorandum of Agreement
MOC	Mid-Oregon coast
MOU	Memorandum of Understanding
MPA	Marine protected areas
MPRSA	Marine Protection Research and Sanctuaries Act. The MPRSA authorizes the Secretary of Commerce (with Presidential approval) to designate ocean marine sanctuaries.
MRFSS	Marine Recreational Fisheries Statistics Survey. See above.
MRPZ	Marine resources protection zone
MRWG	Marine Reserve Work Group
MSA	Magnuson-Stevens Fishery Conservation and Management Act. See above.
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act. See above.
MSP	Maximum sustainable production
MSST	Minimum stock size threshold. See above.
MSY	Maximum sustained yield. See above.
mt	Metric ton. 1000 kilos or 2,204.62 pounds. (A “short ton” is 2000 lbs.)
MUS	Management Unit Species
NA	Not available
NAO	NOAA Administrative Order

Acronym	Definition
National Environmental Policy Act	Passed by Congress in 1969, NEPA requires Federal agencies to consider the environment when making decisions regarding their programs. Section 102(2)(C) requires Federal agencies to prepare an Environmental Impact Statement (EIS) before taking major Federal actions that may significantly affect the quality of the human environment. The EIS includes: the environmental impact of the proposed action, any adverse environmental effects which cannot be avoided should the proposed action be implemented, alternatives to the proposed action, the relationship between local short-term uses of the environment and long-term productivity, and any irreversible commitments of resources which would be involved in the proposed action should it be implemented.
National Marine Fisheries Service	A division of the U.S. Department of Commerce, National Ocean and Atmospheric Administration (NOAA). NMFS is responsible for conservation and management of offshore fisheries (and inland salmon). The NMFS Regional Director is a voting member of the Council.
National standard guidelines	Guidelines issued by National Marine Fisheries Service to provide comprehensive guidance for the development of fishery management plans and amendments that comply with the national standards of the Magnuson-Stevens Act. These guidelines are found in Title 50, Code of Federal Regulations, part 600.
NBS	National Bureau of Standards
NCEAS	National Center for Ecological Analysis and Synthesis
NCRS	National Resource Conservation Service
NE	Northeast
Nearshore	"Nearshore" is defined (by the California Nearshore Fishery Management Plan) as the area from the high-tide line offshore to a depth of 120 ft (20 fm).
NEPA	National Environmental Policy Act. See above.
Neritic	Inhabiting coastal waters primarily over the continental shelf, generally over bottom depths equal to or less than 183 meters (100 fm) deep.
NEV	Net economic value(s)
NFCC	National Fisheries Conservation Center
NGO	Nongovernmental organization
nm	Nautical mile
NMFS	National Marine Fisheries Service. See above.
NMFS NWFSC	National Marine Fisheries Service Northwest Fisheries Science Center
NMFS NWR	National Marine Fisheries Service Northwest Region
NMFS SWR	National Marine Fisheries Service Southwest Region
NMSA	National Marine Sanctuaries Act

Acronym	Definition
NMSP	National Marine Sanctuaries Program
NNB	Net National Benefits
NOAA	National Oceanic & Atmospheric Administration. The parent agency of National Marine Fisheries Service.
NOC	North Oregon coast
NOF	North of (Cape) Falcon, Oregon
NOI	Notice of Intent
Nontrawl	Within the context of the groundfish limited fleet, “nontrawl” and “fixed gear” are the same, i.e. longline and fishpot gear. Within the context of the entire groundfish fishery, nontrawl gear includes longline, fishpot, and any other gear that is not trawl gear (troll, gillnet, vertical hook-and-line, etc.).
NORPAC	North Pacific Database Program
NOS	National Ocean Service
NPCC	Northwest Power and Conservation Council (formerly known as the Northwest Power Planning Council)
NPFMC	North Pacific Fishery Management Council. The NPFMC consists of the state of Alaska, with representation by Washington and Oregon.
NPOA	National Plan of Action
NPTZ	North Pacific Transition Zone
NRC	National Research Council
NRC	National Resource Consultants
NRDC	Natural Resources Defense Council
NS	Nearshore. See above.
NSF	National Science Foundation
NSG	National Standards Guidelines. See above.
NURP	National Undersea Research Program
NWAFC	Northwest and Alaska Fisheries Centers (two separate science centers)
NWFSC	Northwest Fisheries Science Center (in Seattle; a division of NMFS).
NWIFC	Northwest Indian Fisheries Commission
NWR	Northwest Region
OA	Open access fishery. See below.
OC	Oregon Coast (coho)
Oceanic	Inhabiting the open sea, ranging beyond the continental and insular shelves, beyond the neritic zone.

Acronym	Definition
OCZMA	Oregon Coast Zone Management Act
ODFW	Oregon Department of Fish and Wildlife
OMB	Office of Management and Budget
OPAC	(Oregon) Ocean Policy Advisory Council
Open-access fishery	The segment of the groundfish fishery or any other fishery for which entry is not controlled by a limited entry permitting program.
Optimum yield	The amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems. The OY is developed on the basis of the Maximum Sustained Yield from the fishery, taking into account relevant economic, social, and ecological factors. In the case of overfished fisheries, the OY provides for rebuilding to a level that is consistent with producing the Maximum Sustained Yield for the fishery.
OR	Oregon
Oregon production index (OPI)	A measure of the abundance of adult coho salmon produced in the Columbia River and Oregon coastal hatcheries and streams. It is the sum of ocean sport and troll catches off the Columbia River, Oregon, and California; Oregon coastal hatchery returns; and the inriver gillnet catch, Bonneville Dam counts, and hatchery returns to the Columbia River below Bonneville Dam.
OSP	Optimum sustainable production
OSP	Oregon State Police
OTC	Oregon Trawl Commission
Overcapacity	A level of fishing pressure that threatens to reduce a stock or complex below the abundance necessary to support maximum sustainable yield and allow an economically sustainable fishing industry.
Overfished	Any stock or stock complex whose size is sufficiently small that a change in management practices is required to achieve an appropriate level and rate of rebuilding. The term generally describes any stock or stock complex determined to be below its overfished/rebuilding threshold. The default proxy is generally 25% of its estimated unfished biomass; however, other scientifically valid values are also authorized.
Overfishing	Fishing at a rate or level that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis. More specifically, overfishing is defined as exceeding a maximum allowable fishing mortality rate. For any groundfish stock or stock complex, the maximum allowable mortality rate will be set at a level not to exceed the corresponding MSY rate (FMSY) or its proxy.
Overhead	The amount by which the allocation of a fishery would be exceeded if every vessel took the available cumulative limit.

Acronym	Definition
OY	Optimum yield. See above.
PacFIN	Pacific Coast Fisheries Information Network. Provides commercial fishery information for Washington, Oregon, and California. Maintained by the Pacific States Marine Fisheries Commission.
Pacific decadal oscillation	A long-term, El Nino-like pattern of Pacific Ocean climate variability.
Pacific States Marine Fisheries Commission	The PSMFC is a non-regulatory agency that serves Alaska, California, Idaho, Oregon and Washington. PSMFC (headquartered in Portland) provides a communication exchange between the Pacific Fishery Management Council and the North Pacific Fishery Management Council, and a mechanism for federal funding of regional fishery projects. The PSMFC provides information in the form of data services for various fisheries.
PBR	Potential biological removal. See below.
PCFFA	Pacific Coast Federation of Fishermen's Associations
PDO	Pacific decadal oscillation. See above.
PEIS	Programmatic Environmental Impact Statement. An EIS that applies to an entire program or management regime, rather than a specific action.
Pelagic	Inhabiting the water column as opposed to being associated with the sea floor; generally occurring anywhere from the surface to 1000 meters (547 fm). See also epipelagic and mesopelagic.
Permit stacking	The registration of more than one limited entry permit for a single vessel, where a vessel is allowed additional catch for each additional permit registered for use with the vessel.
PFMC	Pacific Fishery Management Council
PGPs	Programmatic General Permits
P_{MAX}	The estimated probability of reaching $T_{MAX.}$ May not be less than 50%.
PMCC	Pacific Marine Conservation Council
POCTRT	Pacific Offshore Cetacean Take Reduction Team
POP	Pacific Ocean perch. A rockfish species that was declared overfished in 1999.
Potential biological removal	The maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.
PRA	Paperwork Reduction Act
Preferred alternative	The alternative that is identified as preferred by the authors of an environmental impact statement or environmental assessment. It is identified to indicate which alternative is likely to be selected, thereby helping the public focus its comments.

Acronym	Definition
Processing	The preparation or packaging of fish to render it suitable for human consumption, retail sale, industrial uses, or long-term storage, including but not limited to cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, but not heading and gutting unless additional preparation is done.
Proposed alternatives	Alternatives proposed by the Council for a proposed management action (such as annual management specifications). The alternatives are presented to the public for comment, and are voted upon at a subsequent Council meeting. The options always include a "status quo" alternative (for example the current season's ABCs and OYs).
PSC	Pacific Salmon Commission
PSEIS	Programmatic Supplemental Environmental Impact Statement
PSMFC	Pacific States Marine Fisheries Commission. See above.
Q	The relation between selectivity of survey fishing and actual (commercial) fishing. Selectivity is a measure of the proportion of fish encountered by gear to those that are actually caught.
QS	Quota share(s)
QS	Quota shares (related to individual fishing quotas)
QSM	Quota species monitoring. See below.
Quota	A specified numerical harvest objective, the attainment (or expected attainment) of which causes closure of the fishery for that species or species group.
Quota shares	A share of the Total Allowable Catch (TAC) allocated to an operating unit such as a vessel, a company or an individual fisherman (individual quota) depending on the system of allocation. Quotas may or may not be transferable, inheritable, and tradable. While generally used to allocate total allowable catch, quotas could be used also to allocate fishing effort or biomass.
Quota species monitoring	Quota species monitoring is a PacFIN database that monitors the cumulative landings of species managed either with individual OYs or OYs prescribed for a species complex (grouping of species in a single management unit). The GMT uses quota species monitoring to develop inseason groundfish fishery management recommendations to attempt to attain, but not exceed, prescribed OYs.
R	Recruits or recruitment.
R/S	Recruits per spawner
R_0	Level of unfished recruitment
RCA	Rockfish Conservation Area (Depends on how it is used)
RCA	Riparian conservation area
RD	Regional Director. Usually, the Regional Director of the National Marine Fisheries Service.

Acronym	Definition
Rebuilding	Implementing management measures that increase a fish stock to its target size.
Rebuilding analysis	An analysis that uses biological information to describe the probability that a stock will rebuild within a given timeframe under a particular management regime.
Rebuilding plan	A document that describes policy measures that will be used to rebuild a fish stock that has been declared overfished.
RecFin	Recreational Fishery Information Network. A database managed by the Pacific States Marine Fisheries Commission that provides recreational fishery information for Washington, Oregon, and California.
Recruits	Recruits are a group ("cohort") of young fish that enter a fish stock in one year.
Recruits/recruitment	The estimated production of new members to a fish population as measured at a specific life stage.
Regulatory Flexibility Analysis (or Act)	Regulatory Flexibility Act (see IRFA and FRFA above). See below. The Regulatory Flexibility Act (5 U.S.C. 601-612) requires federal agencies to consider the effects of their regulatory actions on small businesses and other small entities and to minimize any undue disproportionate burden.
Regulatory Impact Review	RIRs are prepared to determine whether a proposed regulatory action is "major." The RIR examines alternative management measures and their economic impacts.
RER	Recovery Exploitation Rates
RF	Rockfish
RFA	Regulatory Flexibility Analysis, or Regulatory Flexibility Act. See above.
Riparian area	A land area adjacent to water. Technical definition: "riparian area" means an area of land that (a) is adjacent to a stream, river, lake or wetland, and (b) contains vegetation that, due to the presence of water, is distinctly different from the vegetation of adjacent upland areas. (Code of British Columbia)
RIR	Regulatory Impact Review. See above.
ROD	Record of Decision
ROV	Remotely operated vehicle (submarine)
RPAs	Reasonable and prudent alternatives
Rulemaking	The process of developing Federal regulations which occurs in several steps, including publishing proposed rules in the Federal Register, accepting comments on the proposed rule, and publishing the final rule. An "advanced notice of proposed rulemaking" is published when dealing with especially important or controversial rules.
SAFE	Stock assessment and fishery evaluation. See below.

Acronym	Definition
Saltonstall-Kennedy Act	The Saltonstall-Kennedy Act allocates 30% of the duties for imported fishery products to technological, biological, marketing, and other research and services in order to promote the free flow of domestically-produced fishery products and to develop markets for domestic fishery products.
SAP	Sanctuary Advisory Subpanel
SAS	Salmon Advisory Subpanel
SBA	Small Business Administration
SCB	Southern California Bight
Scientific and Statistical Committee	An advisory committee of the PFMC made up of scientists and economists. The Magnuson-Stevens Act requires that each council maintain an SSC to assist in gathering and analyzing statistical, biological, ecological, economic, social, and other scientific information that is relevant to the management of Council fisheries.
SDC	Status Determination Criteria
SEA	Socioeconomic Analysis
Secretary	U.S. Secretary of Commerce
SEIS	Supplemental Environmental Impact Statement (see Environmental Impact Statement)
SFA	Sustainable Fisheries Act of 1996. Amended the MSFCMA.
SFO	Sustainable Fisheries Office (NMFS)
Shelf rockfish	Rockfish that live on the continental shelf
SIA	Social impact analysis
SIC	Standard Industrial Classifications
S-K	Saltonstall-Kennedy. See above.
Slope rockfish	Rockfish that live on the continental slope
SOC	Secretary of Commerce. The Secretary has responsibility for reviewing, approving, and implementing a fishery management plan.
SOPP	Statement of Organization, Practices, and Procedures
Southern California bight	See California Bight, above.
Spawning biomass	The biomass of mature female fish at the beginning of the year. If the production of eggs is not proportional to body weight, then this definition is construed to be proportional to expected egg production.
SPR	Spawning biomass per recruit
SRS	Stratified Random Sampling
SSB	Spawning stock biomass

Acronym	Definition
SSC	Scientific and Statistical Committee. See above.
SST	Sea surface temperature
STAR	Stock assessment review
STAR Panel	Stock Assessment Review Panel. A panel set up to review stock assessments for particular fisheries. In the past there have been STAR panels for sablefish, rockfish, squid, and other species.
STAT	Stock Assessment Team. Develops stock assessments.
Stock Assessment and Fishery Evaluation	A SAFE document is a document prepared by the Council that provides a summary of the most recent biological condition of species in the fishery management unit, and the social and economic condition of the recreational and commercial fishing industries, including the fish processing sector. It summarizes, on a periodic basis, the best available information concerning the past, present, and possible future condition of the stocks and fisheries managed in the FMP.
STT	Salmon Technical Team
SWFSC	Southwest Fisheries Science Center (NMFS)
TAC	Total allowable catch. See below.
TALFF	Total allowable level of foreign fishing
Target fishing	Fishing for the primary purpose of catching a particular species or species group (the target species).
Territorial sea	The territorial sea of the United States extends 12 nautical miles offshore. States exercise authority over marine fisheries in waters from the coastline to 3 miles offshore.
TES	Threatened and Endangered Species
TIN	Tax Identification Number
TIQC	Ad Hoc Groundfish Trawl Individual Quota Committee
T_{MAX}	The maximum time period to rebuild an overfished stock, according to National Standard Guidelines. Depends on biological, environmental, and legal/policy factors.
T_{MIN}	The minimum time period to rebuild an overfished stock, according to National Standard Guidelines. Technically, this is the minimum amount of time in which a fish stock will have a 50% chance of rebuilding if no fishing occurs (depends on biological and environmental factors).
Total allowable catch	The total regulated catch from a stock in a given time period, usually a year. (NMFS)
Total catch OY	Total catch optimum yield. The landed catch plus discard mortality.
T_{TARGET}	The target year, set by policy, for a fish stock to be completely rebuilt.

Acronym	Definition
U/A	Usual and accustomed (usually used when referring to tribal fishing, hunting or gathering areas)
ULS	Unconstrained Least Squares
USC	United States Code
USCG	U.S. Coast Guard. A representative of the USCG is a non-voting member of the Council.
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service. A representative of USFWS is a non-voting member of the Council.
USGS	U.S. Geological Survey
Vessel Monitoring System	A satellite communications system used to monitor fishing activities—for example, to ensure that vessels stay out of prohibited areas. The system is based on electronic devices (transceivers), which are installed on board vessels. These devices automatically send data to shore-based "satellite" monitoring system.
VMS	Vessel monitoring system. See above.
VPA	Virtual population analysis. A modeling method used in conducting stock assessments.
VSI	Visual stock identification
WA	Washington
WCGOP	West Coast Groundfish Observer Program
WCSPA	West Coast Seafood Processors Association
WCVI	West Coast Vancouver Island
WDFW	Washington Department of Fish and Wildlife. A representative of WDFW sits on the Council.
WOC	Washington, Oregon and California
Yield per recruit	A model that estimates yield in terms of weight, but more often as a percentage of the maximum sustainable yield, for various combinations of natural mortality, fishing mortality and time exposed to the fishery (NOAA).
YPR	Yield per recruit. See above.
YRCA	Yelloweye Rockfish Conservation Area
ZMRG	Zero Mortality Rate Goal. A goal stated in the Marine Mammal Protection Act that the "incidental kill or incidental serious injury of marine mammals permitted in the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality and serious injury rate."

14.0 LITERATURE CITED

Bibliography to be compiled in final DEIS.

15.0 INDEX

To be completed for final DEIS.

Agenda Item F.2.b
ODFW Report 2
June 2006

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT ON THE PROPOSED STONEWALL BANKS YELLOWEYE ROCKFISH CONSERVATION AREA

The Oregon Department of Fish and Wildlife (ODFW) recommends consideration of a third option (Figure 1) for the implementation of a recreational Yelloweye Rockfish Conservation Area (YRCA) located at Stonewall Banks, off the coast of Newport, Oregon. This third option is within the range of options for development of a recreational Stonewall Banks YRCA, previously adopted by the Pacific Fishery Management Council (PFMC) at its April 2006 meeting.

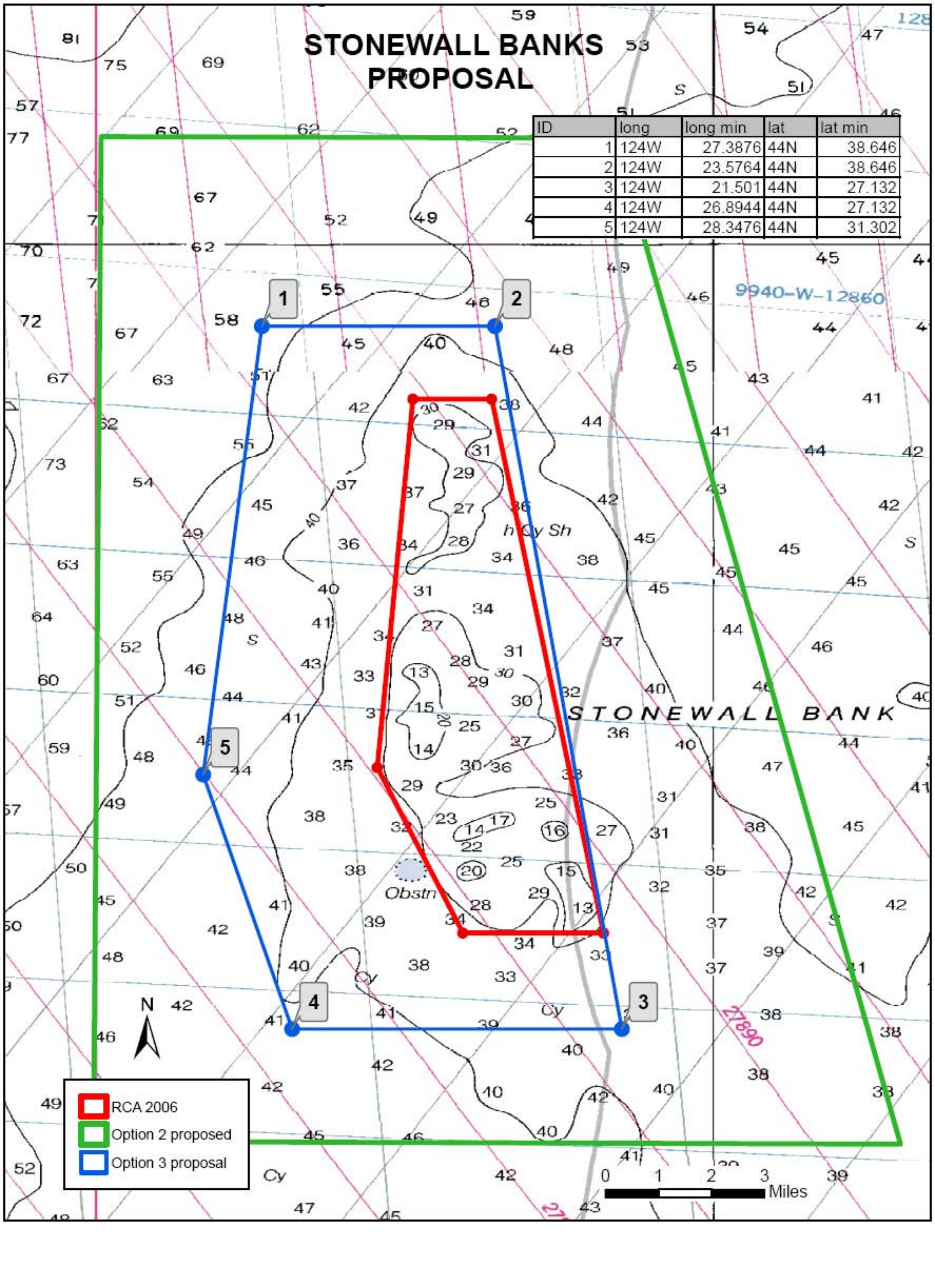
ODFW met with recreational fishery participants in Newport, Oregon on May 17, 2006 to discuss the range of management measures for the 2007-2008 recreational groundfish fisheries that were adopted by the PFMC at its April 2006 meeting. One of the topics at that meeting was the development of the recreational Stonewall Banks YRCA. Anglers fishing in this area would be prohibited from retaining groundfish, regardless of target species. This area may also be implemented in the Pacific halibut fishery beginning in 2007 as an area closed to the retention of Pacific halibut, replacing the closure that currently exists in that fishery. Adjustments to the 2007 Pacific halibut Catch Sharing Plan would be made as appropriate. Consideration may be given to allow vessels that have retained Pacific halibut (from outside the closed area) to troll (mooching prohibited) for salmon within the closed area.

The fishery participants that were present at the Newport meeting crafted the area proposed as Option 3, based on long-term knowledge of the area. Additionally, in 2005, ODFW conducted a research project, scoping the viability of employing external acoustic tags on yelloweye rockfish to determine site fidelity characteristics, and discard mortality. Tags were placed on 6 yelloweye rockfish; all were intercepted outside of the south-east border of the Option 1 closure area; area that is included in Option 3 boundaries.

A management alternative that was introduced at the Newport meeting was to require vessels within the closure area to troll only, regardless of target species, or retained catch. This means that any vessel fishing within this area would be required to have the vessel in gear at all times while in the closure area. Anglers would be able to retain any species of fish (i.e. groundfish, Pacific halibut, salmon, etc.) caught while in the area. This alternative requires further consideration.

The northern boundary of Option 3 is currently under review, and is awaiting further discussion with fishery participants. ODFW staff is currently working with fishery participants to determine an appropriate northern boundary, as data collected in the International Pacific Halibut Commission stock assessment survey indicates presence of yelloweye rockfish further north than the current northern boundary within Option 3. Adjusted coordinates will be provided to the PFMC at its June 2006 meeting.

Figure 1. Each of the three options for the implementation of a recreational Stonewall Banks YRCA. Option 1 is the smallest box and represents the current closure in the Pacific halibut fishery. Option 2 is the largest box, and Option 3 is the box in between.



SUMMARY OF THE BIOLOGICAL AND SOCIOECONOMIC EFFECTS OF THE 2007-2008 ACTION ALTERNATIVES

Introduction

The preliminary draft environmental impact statement (DEIS), "Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures for the 2007- 2008 Pacific Coast Groundfish Fishery and Amendment 16-4: Rebuilding Plans for Seven Depleted Pacific Coast Groundfish Species – Preliminary Draft Environmental Impact Statement" (Agenda Item F.2.a, Attachment 4), includes extensive analysis of the effects of rebuilding the seven depleted groundfish species subject to revised rebuilding plans under Amendment 16-4. These rebuilding analyses explore the time to rebuild under various levels of harvest (i.e., alternative optimum yields (OYs)), including a "no fishing" scenario (F=0); and the corresponding economic implications to groundfish sectors, ports, and fishing communities; and the interaction of depleted species within the marine ecosystem.

Alternative 2007-2008 groundfish management measures, referred to as Action Alternatives in the preliminary DEIS, are designed to provide fishing opportunities to harvest healthy, target species within the constraints of alternative depleted species' OYs. The three Action Alternatives decided by the Council in April 2006 follow a gradient of conservatism, with Action Alternative 1 being the most conservative in that these management measures constrain fishing opportunities the most, but result in faster rebuilding. Conversely, Action Alternative 3 has the most liberal management measures and provides the most fishing opportunity at a cost of longer rebuilding times. Action Alternative 2 is intermediate in the predicted effects to fishing opportunities and rebuilding times.

The Council decided preferred 2007-2008 OYs for all non-depleted species and two OY alternatives (a preferred Low OY Alternative and a preferred High OY Alternative) for detailed analysis at their April 2006 meeting. Action Alternative 1 management measures are designed to stay within the preferred Low OYs for depleted species and Action Alternative 3 management measures are designed to stay within the preferred High OYs for depleted species in 2007-2008. Action Alternative 2 has intermediate effects, staying within the preferred Low OY for some depleted species and otherwise staying within the preferred High OY. Table 1 depicts the estimated take of depleted species in Action Alternatives 1-3, respectively.

This document summarizes the key effects of the No Action Alternative, the three action alternatives, and the F=0 scenario in terms of impacts to rebuilding periods for depleted species and socioeconomic impacts. These summary effects are depicted in Table 1 of this document. Table 2 summarizes the combined recreational and commercial income impacts of the No Action and action alternatives by West Coast region. Figure 1 depicts trends in groundfish exvessel revenues since 1981, with projections through 2008 under each of the action alternatives. Table 3 lists the most vulnerable counties associated with changes in groundfish management measures. These tables and Figure 1 provide a "snapshot" of the bottom line biological and socioeconomic effects of the action alternatives.

The F=0 Alternative
The shortest possible rebuilding times are predicted for depleted species under the F=0 alternative (denoted $T_{F=0}$, the time to rebuild in the absence of fishing-related mortality) since fishing-related mortality is eliminated beginning in 2007. This alternative is a comparison "benchmark" in this preliminary DEIS since the Council has decided to allow some harvest under groundfish rebuilding plans to avoid disastrous short-term socioeconomic impacts.

Under the F=0 alternative, multiple sectors are closed and fishing communities experience substantial losses of commercial fishing-related revenue and recreational fishing effort and expenditures (Table 7-69 of the preliminary DEIS). Compared to 2005 revenues, commercial fishery exvessel revenue would be decreased by over $177 million, and the number of recreational angler trips would decrease by over 1.1 million. These figures represent a closure of all groundfish-related commercial revenues, all groundfish-related recreational angler trips, and multiple non-groundfish sectors.

Action Alternative 1
Action Alternative 1 constrains fisheries to the preferred Low OYs for depleted species and therefore results in the shortest rebuilding times considered by the Council for Amendment 16-4 rebuilding plans. Rebuilding is extended by less than five years relative to $T_{F=0}$ for bocaccio, cowcod, darkblotched rockfish, Pacific ocean perch, and widow rockfish. Canary and yelloweye rockfish rebuilding periods are extended by an estimated 7 and 35 years, respectively under Action Alternative 1.

Action Alternative 1 reduces rebuilding species OYs compared to status quo catch levels, and as a result, revenues generated by commercial fisheries directed at groundfish are lower than status quo levels, and the number of recreational bottomfish trips is lower than status quo. Under this alternative, many of the target species OYs are not attained, and fishing area is decreased for all sectors as the size of groundfish conservation areas is expanded to encompass more area where rebuilding species are found. Under this alternative, exvessel revenues for the major directed groundfish sectors are estimated to be approximately $42.8 million, and the number of recreational angler trips for bottomfish is estimated to be 350,690. These figures represent approximately 62% of exvessel revenues generated in 2005, and 65% of the number of angler trips in 2005.

Action Alternative 2
Action Alternative 2 effects are intermediate to the other action alternatives. Alternative 2 management measures explore different ways to constrain fishing-related mortality of depleted species and reveal distributional effects to fishing sectors and regions resulting from these alternative measures. Table 1 shows the estimated impacts to depleted species under Action Alternative 2 management measures are within the preferred Low OY for cowcod, but within the preferred High OY for the other six depleted species. Predicted rebuilding times under Action Alternative 2 are likewise intermediate to those under the other action alternatives and proportional to the amount of allowable harvest if that harvest rate is maintained during the entire rebuilding period.

Action Alternative 2 brings rebuilding species OYs to levels that are near status quo catch amounts for many rebuilding species except for yelloweye rockfish. While OYs for rebuilding species are near status quo, negative economic impacts are greater than alternative 1, but less than Action Alternative 3. In addition, a larger portion of the OY remains unattributed to any particular sector.

While many of the OYs for rebuilding species are near status quo, and there are relatively large amounts of OYs not attributed to any particular sector, the amount of exvessel revenues are different for certain sectors and regions of the fishery when compared to 2005 and 2006 revenues. While some sectors have higher exvessel revenues than 2005 or 2006, others have lower exvessel revenues. The difference in the distribution of revenues is directly attributed to changes in target species abundance and OYs. For example, the increase in the 2007 OY for Dover sole results in larger exvessel revenue for the bottom trawl sector as a whole, while the decrease in the 2007 OY for sablefish results in lower coastwide exvessel revenues for the fixed gear sablefish sectors.

On a coastwide basis, combined exvessel revenues for the major directed groundfish sectors are estimated to be approximately $59.7 million, and the number of recreational angler trips for bottomfish is estimated to be 421,271. These figures represent approximately 87% of 2005 exvessel revenues, and 78% of 2005 bottomfish angler trips.

Action Alternative 3
Action Alternative 3 constrains fisheries to the preferred High OYs for depleted species and therefore results in longer rebuilding times relative to the other action alternatives. Rebuilding is extended by five years or less relative to $T_{F=0}$ for bocaccio, darkblotched rockfish, Pacific ocean perch, and widow rockfish. Cowcod, canary and yelloweye rockfish rebuilding periods are extended by an estimated 8, 10, and 36 years, respectively under Action Alternative 3.

Action Alternative 3 brings rebuilding species OYs to levels that are near status quo catch amounts for many rebuilding species except for yelloweye rockfish. The overall economic impact of Action Alternative 3 is that many sectors are expected to achieve social and economic benefits that are similar to status quo levels. However, like Action Alternative 2, there are differences in the distribution of exvessel revenue and angler trips on a regional basis and on a sector-by-sector basis. This change is driven by changes in the abundance and OYs for target species, as well as changes in the yelloweye OY. The change in the yelloweye OY negatively impacts recreational fisheries in the northern areas, but recreational fisheries in the southern areas are able to attain a higher number of angler trips than under 2005 and 2006 regulations. In the case of commercial fisheries, the bottom trawl sector is able to attain higher levels of exvessel revenues when compared to 2005 and 2006, primarily as a result of the increase in the Dover sole OY. Alternatively, the fixed gear sablefish sectors achieve lower levels of revenue because of a decrease in the sablefish OY.

On a coastwide basis, commercial exvessel revenues for the major directed groundfish sectors are estimated to be approximately $64.9 million, and the number of recreational bottomfish trips is estimated to be 587,873. These figures represent 94% of 2005 exvessel revenues, and 109% of 2005 recreational angler trips.

The Economic Implications of Uncertainty and Management Flexibility
The economic impact estimates in the preliminary DEIS are based on management measures that achieve some level of target and non-target species catch or recreational fishing opportunity. Catch projections, revenue estimates, and recreational effort projections are, as with any

projection or estimate, subject to varying degrees of accuracy. While they do in fact represent the best estimate of catch and socioeconomic impacts, these estimates will inherently differ from what actually occurs in the fishery when the 2007 fishing year progresses. These differences can be due to such things as changes in catch per unit effort, unexpected weather patterns, unexpected ocean conditions, changes in the behavior or availability of the fish stocks, or changes in effort on the part of fishermen, amongst other things. Empirical evidence and past experience has shown that catch projections will ultimately differ to some degree from what actually occurs. Some projections will be less than what occurs and some will be higher than what actually occurs. Rebuilding species catch estimates that end up being less than what actually occurs in the fishery have the potential to negatively impact fishing sectors if an inseason management response is necessary to keep the catch of that rebuilding species within the OY. While the catch of rebuilding species that are higher than expected may provide for some amount of revenue or angler satisfaction, rebuilding species provide little social and economic benefit because they represent a small portion of the fishery, but constrain abundant target species. This is because of the mixed stock nature of the fishery. When an inseason action is necessary to stay within a rebuilding species OY because of unexpectedly high catch, that inseason action will typically result in a loss of social and economic benefits as the fishery becomes constrained to minimize further catch of that rebuilding species. While it is impossible to know which species are likely to have higher or lower actual catches than predicted, it can almost always be expected that it will occur to some degree. That is, it is a matter of when catches will differ from predictions and for what species, not a matter of if actual catches will differ from predictions.

The amount of uncertainty related to the catch projections of rebuilding species is directly related to the economic impacts of management measures designed to achieve a given catch level. If OYs are constructed in a manner that takes into account the reality that catch predictions have a certain level of uncertainty (that is, if OYs are higher than predicted total catch) then the economic impact that is predicted prior to the start of the season for a given set of management measures becomes more certain. As the difference between the OY of rebuilding species and predicted catch increases, the economic impacts resulting from management measures becomes increasingly more certain. Inversely, as the difference, or “buffer” between the OY of a rebuilding species and predicted catch decreases, the certainty of the economic impacts predicted for that particular management scheme is reduced. If the OY for all rebuilding species is determined from predicted catch, it can be guaranteed that the actual economic impacts resulting from that suite of OYs will be lower than what is predicted because the actual catch of one or more rebuilding species will be higher than expected and some constraining management response will be necessary at some point during the year. A management system designed in a manner where each stock is equally constraining has no flexibility to respond to likely departures from predictions.

Management of groundfish fisheries throughout much of the 2002-2006 period have relied on some degree of management flexibility to keep rebuilding species catch levels within their respective OYs while maintaining some amount of social and economic benefits. For example, a typical review of inseason catches will reveal that the catch of one or more rebuilding species is higher than what was anticipated. The response has often been to implement a change in management regulations which shifts major portions of the fishery to areas where rebuilding species that are experiencing higher than anticipated catch levels may not be as abundant, but other rebuilding species may be found in greater abundance. This effectively reduces catches of rebuilding species that may be tracking ahead of projections, but it may increase the catch of other rebuilding species. The social and economic impact of restricting the fishery in some areas is often mitigated by the ability to move the fishery to other areas. Without a buffer between predicted catch of rebuilding species and rebuilding species OYs, this type of management flexibility would not be possible, and the actual social and economic impact associated with particular catch levels is likely to be lower than what was expected. Therefore, if it is an objective to maintain some certainty that a level of social and economic benefit related to fishing activities will occur over the course of a year, then a buffer between predicted catches of rebuilding species and the OY of rebuilding species is necessary.

Effects on West Coast Fishing Communities

A consideration in deciding groundfish rebuilding plans is the effect of management measures on West Coast fishing communities. Chapter 7 and Appendix A of the preliminary DEIS explores the socioeconomic impacts of alternative harvest levels and corresponding management measures on West Coast fishing sectors, ports, and communities. This report summarizes these effects at the county level by listing those counties that are considered "vulnerable" and "most vulnerable" to changes in management measures by ranking those counties that are most engaged in fishing or dependent on the groundfish fishery and least resilient to negative socioeconomic impacts (Table 3).

In this analysis, a county is "commercially engaged" in fishing if it ranks among the top one-third of all coastal counties in at least one of four indicators (number of vessels, permits, dealers, or revenue). A county is "commercially dependent" on groundfish resources if it ranks among the top one-third of all coastal counties in at least one of three indicators (groundfish permits and two groundfish revenue measurements). A county is "recreationally engaged or dependent" on fishing if it ranks among the top one-third of all coastal counties in at least one of four indicators (four measurements of the number of angler and charter trips). A county is "least resilient" if it ranks among the top one-third of all coastal counties in at least one of four indicators (industry diversification, unemployment rate, percentage of the population living below the poverty level, and population) used as proxies for economic resiliency. A county is listed as "vulnerable" if it is commercially engaged and least resilient, commercially dependent and least resilient, or recreationally engaged or dependent and least resilient. A county is listed as "most vulnerable" if it is listed among the top one-third of "commercially engaged", "commercially dependent", or "recreational engaged or dependent" indicators at least three times and is listed among the top one-third of resiliency indicators at least three times.

Table 1. Estimated rebuilding duration for depleted groundfish fisheries and predicted socioeconomic impacts under 2007-2008 Action Alternatives and a "no fishing" scenario.

Action Alternative	Depleted Species	OY (mt)	Estimated Impacts[a/] (mt)	Median Time to Rebuild[b/]	Exvessel Revenue for Major Groundfish Sectors[c/]	Recreational Effort[d/] (no. of trips)
No Action Alternative (2006 specifications and management measures)	Bocaccio	309	135	2029		
	Canary	47	44	2064		
	Cowcod	4.2	3.4	2039		
	Darkblotched	200	182	2010		
	Pacific Ocean Perch	447	74	2023		
	Widow	289	257	2015		
	Yelloweye	27	20	2120		
	Socioeconomic Impacts				$68,765,000	538,929
F=0 (No groundfish fishing)	Bocaccio	0	0	2021		
	Canary	0	0	2053		
	Cowcod	0	0	2035		
	Darkblotched	0	0	2009.5		
	Pacific Ocean Perch	0	0	2014.6		
	Widow	0	0	2013		
	Yelloweye	0	0	2048		
	Socioeconomic Impacts				$ 0	0
Action 1 (Constrains fisheries to the preferred Low OYs for depleted species)	Bocaccio	40	39	2022		
	Canary	32	25	2060		
	Cowcod	4	0.5	2039		
	Darkblotched	130	81	2010		
	Pacific Ocean Perch	44	44	2015		
	Widow	120	116	2014		
	Yelloweye	12.6	11	2083		
	Socioeconomic Impacts				$42,772,000	350,690
Action 2 (Intermediate constraints to fisheries)	Bocaccio	218	111	2026		
	Canary	44	33	2063		
	Cowcod	8	3.3	2043		
	Darkblotched	229	197	2010		
	Pacific Ocean Perch	100	99	2016		
	Widow	368	144	2015		
	Yelloweye	Ramp-down[e/]	14.3	2084		
	Socioeconomic Impacts				$59,654,000	421,271
Action 3 (Constrains fisheries to the preferred High OYs for depleted species)	Bocaccio	218	186	2026		
	Canary	44	41	2063		
	Cowcod	8	3.5	2043		
	Darkblotched	229	203	2010		
	Pacific Ocean Perch	100	100	2016		
	Widow	368	191	2015		
	Yelloweye	Ramp-down[e/]	18.3	2084		
	Socioeconomic Impacts				$64,861,000	587,873

a/ Estimated impacts are from the GMT's bycatch scorecards for each alternative. The No Action Alternative represents impacts with inseason adjustments implemented in May 2006.

b/ Median rebuilding time is the estimated time to rebuild the stock if the entire OY is taken and the harvest rate is maintained after 2008 and through the entire course of rebuilding (i.e., harvest is taken at the rate used to determine the OY).

c/ "Major groundfish sectors" includes nearshore groundfish, limited entry bottom trawl, limited entry whiting, fixed gear sablefish, and fixed gear groundfish south of Pt. Conception.

d/ Recreational effort includes only bottomfish trips.

e/ The yelloweye ramp-down strategy ramps the harvest rate down from the status quo harvest rate and resumes a constant harvest rate strategy in 2011. The 2007-2010 OYs are 23 mt, 20 mt, 17 mt, and 14 mt, respectively under the ramp-down strategy.

Table 2. Change (from No Action) in combined estimated commercial and recreational income impacts by region under the action alternatives (million $).

Region	***No Action***	**Alt 1**	**Alt 2**	**Alt 3**
Puget Sound	*15.4*	-2.0	-0.5	-0.4
North Washington Coast	*16.6*	-1.6	-1.2	-0.8
South & Central WA Coast	*121.1*	-11.0	-6.5	-1.0
Astoria-Tillamook	*97.2*	-8.1	-1.0	0.7
Newport	*49.7*	-10.4	-4.3	-0.8
Coos Bay	*32.4*	-3.1	-0.3	0.0
Brookings	*17.7*	-1.5	-0.2	-0.2
Crescent City-Eureka	*19.4*	-3.1	-0.1	0.3
Fort Bragg	*11.3*	-2.4	-0.4	0.3
Bodega Bay - San Francisco	*43.7*	-4.2	-3.3	0.6
Monterey - Morro Bay	*37.7*	-5.3	-4.0	1.9
Santa Barbara	*62.6*	-1.2	-0.7	0.3
Los Angeles - San Diego	*144.2*	-3.7	-1.9	0.9
At-Sea Whiting (including Tribal)	*43.4*	-18.9	-11.1	-1.4
TOTAL	*712.42*	-76.55	-35.49	0.40

Table 3. The vulnerable and most vulnerable counties to change in groundfish management measures.

State	Port Group Area	County	vulnerable*/most vulnerable**
Washington	Puget Sound	Whatcom	*
		San Juan	*
		Skagit	
		Snohomish	
		King	
		Pierce	
		Thurston	
		Mason	
	North Washington Coast	Jefferson	
		Clallam	*
	South & Central WA Coast	Grays Harbor	**
		Pacific	**
Oregon	Astoria-Tillamook	Clatsop	*
		Tillamook	*
	Newport	Lincoln	**
	Coos Bay	Lane	
		Douglas	
		Coos	**
	Brookings	Curry	*
California	Crescent City	Del Norte	*
	Eureka	Humboldt	**
	Fort Bragg	Mendocino	**
	Bodega Bay	Sonoma	
		Marin	
	San Francisco	Alameda	
		Contra Costa	
		San Mateo	
		San Francisco	
	Monterey	Santa Cruz	
		Monterey	*
	Morro Bay	San Luis Obispo	*
	Santa Barbara	Santa Barbara	*
		Ventura	
	Los Angeles	Los Angeles	*
		Orange	
	San Diego	San Diego	

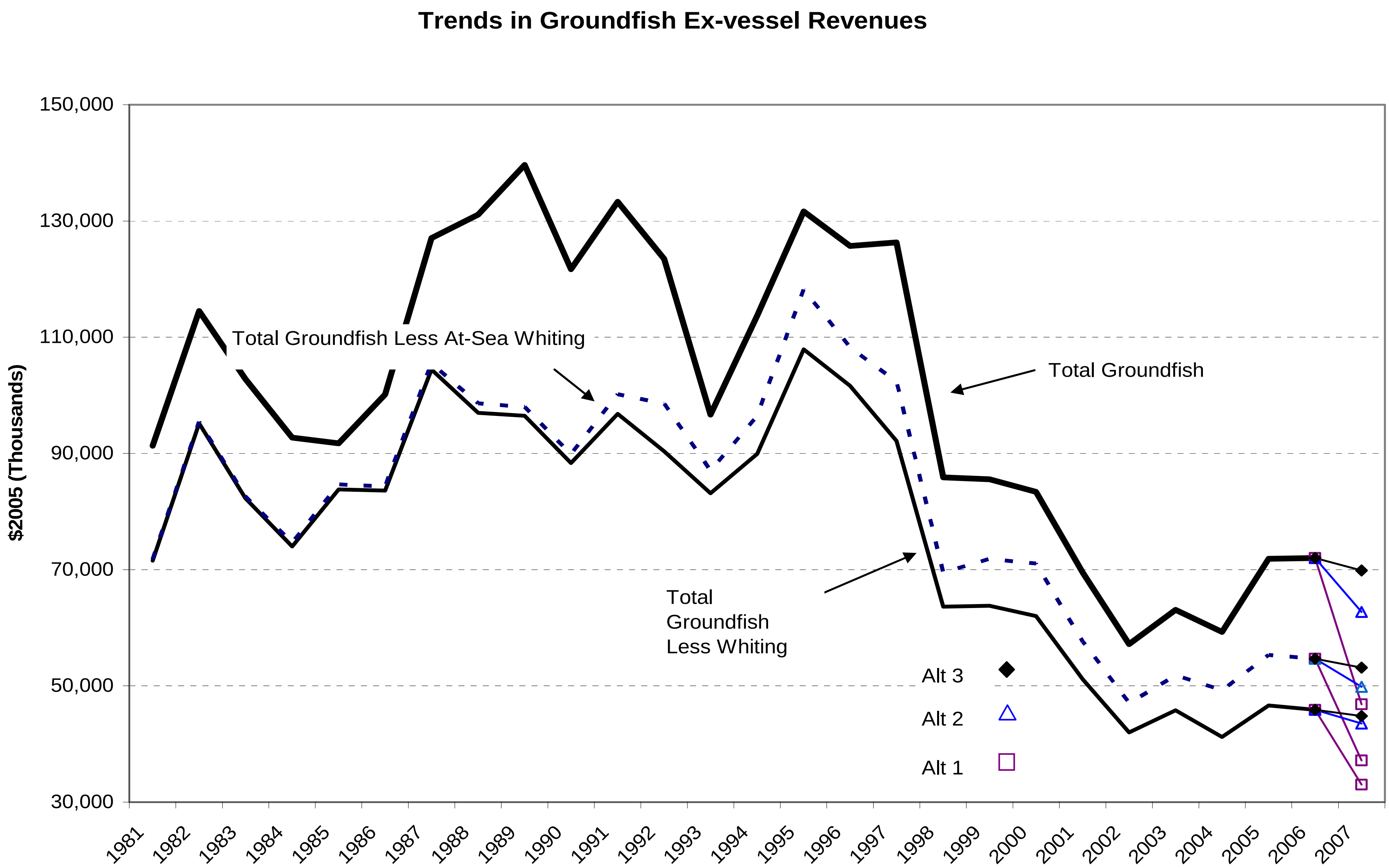


Figure 1. Trends in exvessel revenues from the West Coast groundfish fishery and projected revenues under the 2007-2008 action alternatives.

Agenda Item F.2.a
Supplemental Attachment 6
June 2006

USER'S GUIDE TO THE PRELIMINARY DEIS

Where to Go for Recreational/Commercial Nearshore Information

Chapter 2

Description of Action Alternatives (Proposed Management Measures)

- No Action Alternative (pages 30-60)
    - Table 2-5 (p. 31) – Scorecard for No Action Alternative (Note: For recreational fisheries, for canary and yelloweye, the harvest guidelines are listed)
    - Management Measures
        - Washington Sport (p.51)
        - Oregon Sport (p. 54)
        - California Sport (p. 57)
        - Oregon/N. California Commercial Nearshore (p. 48)
        - California Commercial Nearshore (p.50)
- Action Alternative 1 (most restrictive) (pages 60-75)
    - Table 2-14 (p. 61) – Scorecard for Action Alternative 1
    - Management Measures
        - Washington Sport (p.72)
        - Oregon Sport (p. 72)
        - California Sport (p. 73)
        - Oregon/N. California Commercial Nearshore (p. 70)
        - California Commercial Nearshore (p.70)
- Action Alternative 2 (moderately restrictive) (pages 75-84)
    - Table 2-19 (p. 77) – Scorecard for Action Alternative 2
    - Management Measures
        - Washington Sport (p.81)
        - Oregon Sport (p. 81)
        - California Sport (p. 82)
        - Oregon/N. California Commercial Nearshore (p. 80)
        - California Commercial Nearshore (p.80)
- Action Alternative 3 (least restrictive) (pages 84-92)
    - Table 2-21 (p. 86) – Scorecard for Action Alternative 3
    - Management Measures
        - Washington Sport (p.89)
        - Oregon Sport (p. 89)
        - California Sport (p. 90)
        - Oregon/N. California Commercial Nearshore (p. 88)
        - California Commercial Nearshore (p.88)

Description of Estimated Impacts for Action Alternatives

- Table 2-5 (p. 31) – Scorecard for No Action Alternative (Note: For recreational fisheries, for canary and yelloweye, the harvest guidelines are listed)
- Table 2-14 (p. 61) – Scorecard for Action Alternative 1
- Table 2-19 (p. 77) – Scorecard for Action Alternative 2
- Table 2-21 (p. 86) – Scorecard for Action Alternative 3

Chapter 4

Recreational Harvest Guidelines/Targets

- Table 4-43 (p. 133) – Scorecard with canary OY = 44 mt; with yelloweye ramp-down; apply 2006 catch sharing
- Table 4-44 (p. 134) – Scorecard with canary OY = 44 mt; with yelloweye ramp-down; apply 2005 actual catches for sharing
- Table 4-45 (p. 136) – Scorecard with canary OY = 32 mt; with yelloweye OY = 12.6 mt; apply 2006 catch sharing
- Table 4-46 (p. 137) – Scorecard with canary OY = 32 mt; with yelloweye OY = 12.6 mt; apply 2005 actual catches for sharing
- Tables 4-47 (p. 139) and 4-48 (p. 140) – Scorecards allocate all harvest to recreational
- Tables 4-49 (p. 141) and 4-50 (p. 142) – Scorecards allocate all harvest to commercial

Estimated Impacts of Status Quo and Action Alternatives for Recreational Fisheries

- Table 4-59 (p. 152) Washington recreational fishery impacts for canary and yelloweye
- Table 4-60 (p. 153) Oregon recreational fishery impacts for canary, yelloweye and widow and target species impacts
- Table 4-61 (p. 154) California recreational fishery impacts for depleted species (NOTE: There are harvest guidelines listed for canary and yelloweye for the No Action alternative)

Estimated Impacts of Status Quo and Action Alternatives for Commercial Nearshore Fisheries

- Table 4-57 (p. 151) Commercial nearshore fishery impacts for canary and yelloweye and target species

Estimates of Total Fishing Mortality in Recent Years

Chapter 4

- 2003 – Table 4-5 (p. 58)
- 2004 – Table 4-6 (p. 59)
- 2005 – Table 4-7 (p. 60)

Where to Go for Evaluation of Impacts of Alternatives by Species

<u>Chapter 4</u>

- Bocaccio – Ch 4. pp 64-67,
  - Table 4- 8 (p. 66) Evaluation of OY Alternatives by Criteria
- Canary – Ch 4. pp 67-70,
  - Table 4- 9 (p. 70) Evaluation of OY Alternatives by Criteria
- Cowcod – Ch 4. pp 71-73,
  - Table 4- 10 (p. 71) Evaluation of OY Alternatives by Criteria
- Darkblotched – Ch 4. pp 73-77,
  - Table 4- 11 (p. 77) Evaluation of OY Alternatives by Criteria
- Pacific Ocean Perch – Ch 4. pp 77-79
  - Table 4- 12 (p. 78) Evaluation of OY Alternatives by Criteria
- Widow – Ch 4. pp 79-83,
  - Table 4- 13 (p. 83) Evaluation of OY Alternatives by Criteria
- Yelloweye – Ch 4. pp 83-88,
  - Table 4- 14 (p. 87) Evaluation of OY Alternatives by Criteria

Where to Go for Economic Impacts

<u>Chapter 7</u>

Fishery Trends: Commercial and Recreational Landings, Commercial Ex-Vessel Values

Table 7-1 Total Commercial, Tribal, and Recreational Landings and Deliveries by Sector (Chapter 7 page 55)
Table 7-2a Total domestic shoreside landings and at-sea deliveries from West Coast fisheries (Chapter 7 page 56)
Table 7-2 c Total domestic shoreside landings and at-sea deliveries, (ex-vessel revenues-Inflation Adjusted (Chapter 7 page 60)

Fishery, Sector, Port, Bycatch Relationships

Table 7-3 Overfished Species Ranking by Sector and Area (Chapter 7, page 62)
Table 7-4a Port Engagement in Groundfish Sectors in Areas North of 40-10 N Latitude (Chapter 7, page 63)
Table 7-4b Port Engagement in Groundfish Sectors South of 40-10 N Latitude (Chapter 7, page 64)

Ex-vessel Price and Fuel Cost Trends

Table 7-46 Ex-vessel Price and Fuel Cost Trends (Chapter 7, page 114)

Commercial Ex-vessel and Recreational Trip Projections by Alternative

Table 7-62a Commercial Ex-vessel Projections by Major Sector (Chapter 7, page 130)
Table 7-65a Projected Recreational Effort by Region in 2004 and 2005 and by Alternative (Chapter 7, page 141)

Personal Income Impacts by Alternative

Table 7-68f Combined Recreational and Commercial Impacts by Region and Alternative (Chapter 7, page 155)
Table 7-70 Summary of Percentage Change in Estimated Commercial Fishery Income Impacts by Port Group Compared to No Action Alternative (Chapter 7, page 160)
Table 7-71 Summary of Percentage Change in Estimated Recreational Fishery Income Impacts by Region Compared to No-Action Alternative. (Chapter 7, page 161)

Community Vulnerability Analysis-(Appendix A Tables)

Table A.4-17 Commercial Indicators and Rankings by City (page A-80)
Table A.4-18 Commercial Indicators and Rankings by County (page A-84)
Table A.4-24 California Recreational Indicator Value and Rankings by Region (page A-93)
Table A.4-25 Oregon and Washington Recreational Indicator Values and Rankings by City (page A-93)
Table A.4-28 Resiliency Indicator Values and Ranking by City (page A-95)
Table A.4-29 Resiliency Indicator Values and Rankings by County (page A-96)
Table A.4.32 Commercial and Recreational Scores and Identification of Vulnerable Cities
Table A.4-33 Commercial and Recreational Scores and Identification of Vulnerable Counties

PFMC
06/13/06

At the April Meeting the Council Adopted the Following:

- Fishing Communities need a sustainable fishery that is safe, well managed, and profitable, that provides jobs and incomes, that contributes to the local social fabric, culture, and image of the community, and helps market the community and its services and products.

Table 7-1 Total Commercial, Tribal, and Recreational Landings and Deliveries by Sector

Year	At-Sea Catcher-Processors	At Sea Mother-ships	Shoreside Whiting LE Trawl	Shoreside Non-whiting LE Trawl	Shoreside LE Line Gear	Shore-side LE Pot Gear	Shore-side Directed OA	Shore-side Incidental OA	Recreational	Shore-side Tribal	At-Sea Tribal	Total Ground-fish	Non-Tribal, Non-Whiting Shorebased
			Landings and Deliveries										
1995	61,589	40,175	75,472	48,269	3,000	780	3,769	810	2,473	833	0	237,171	61,574
1996	66,170	43,826	83,699	48,745	3,825	541	3,443	1,073	2,893	903	15,313	270,432	63,414
1997	71,175	50,546	87,814	43,508	3,780	440	3,256	835	2,722	846	25,080	290,002	57,263
1998	70,690	50,371	88,852	34,477	2,301	398	2,563	631	4,979	495	24,787	280,544	50,328
1999	68,357	47,870	84,141	33,797	2,581	719	1,499	666	2,854	778	26,550	269,810	44,969
2000	68,341	47,166	86,210	29,337	2,417	708	1,203	504	2,406	788	6,402	245,481	38,981
2001	59,006	35,798	73,572	23,192	1,959	565	1,223	378	2,526	825	6,330	205,372	32,368
2002	36,580	26,624	45,706	20,271	1,793	372	1,099	406	2,270	918	22,286	158,325	28,481
2003	41,315	26,027	51,313	20,628	1,872	611	1,219	281	3,931	5,452	19,674	172,324	32,474
2004	73,582	24,155	89,986	18,925	1,935	634	1,215	150	1,956	8,698	23,767	245,003	26,773
			Share of Total Landings and Deliveries										
1995	26%	17%	32%	20%	1%	0%	2%	0%	1%	0%	0%	100%	
1996	24%	16%	31%	18%	1%	0%	1%	0%	1%	0%	6%	100%	
1997	25%	17%	30%	15%	1%	0%	1%	0%	1%	0%	9%	100%	
1998	25%	18%	32%	12%	1%	0%	1%	0%	2%	0%	9%	100%	
1999	25%	18%	31%	13%	1%	0%	1%	0%	1%	0%	10%	100%	
2000	28%	19%	35%	12%	1%	0%	0%	0%	1%	0%	3%	100%	
2001	29%	17%	36%	11%	1%	0%	1%	0%	1%	0%	3%	100%	
2002	23%	17%	29%	13%	1%	0%	1%	0%	1%	1%	14%	100%	
2003	24%	15%	30%	12%	1%	0%	1%	0%	2%	3%	11%	100%	
2004	30%	10%	37%	8%	1%	0%	0%	0%	1%	4%	10%	100%	
			Share of Non-Whiting, Non-Tribal Landings and Deliveries										
1995	0	0	0	78%	5%	1%	6%	1%	4%	0	0		100%
1996	0	0	0	77%	6%	1%	5%	2%	5%	0	0		100%
1997	0	0	0	76%	7%	1%	6%	1%	5%	0	0		100%
1998	0	0	0	69%	5%	1%	5%	1%	10%	0	0		100%
1999	0	0	0	75%	6%	2%	3%	1%	6%	0	0		100%
2000	0	0	0	75%	6%	2%	3%	1%	6%	0	0		100%
2001	0	0	0	72%	6%	2%	4%	1%	8%	0	0		100%
2002	0	0	0	71%	6%	1%	4%	1%	8%	0	0		100%
2003	0	0	0	64%	6%	2%	4%	1%	12%	0	0		100%
2004	0	0	0	71%	7%	2%	5%	1%	7%	0	0		100%

Adapted from tables associated with the Allocation Committee's February 2006 Meeting.

Table 7-2a Total domestic shoreside landings and at-sea deliveries from West Coast fisheries

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	3,307	73,557	838	25,972	11,419	59,774	1,729	176,596	102,201	103,039	18,202	174	4	87	160
1982	3,822	67,465	1,027	32,613	18,625	61,470	1,277	61,470	1,277	61,470	12,704	162	8	61	164
1983	4,163	72,100	1,051	29,639	14,685	48,157	889	170,684	97,533	98,584	6,052	58	1	70	322
1984	4,060	78,889	2,721	27,703	14,077	40,020	1,079	168,549	86,939	89,660	4,488	29	0	259	598
1985	3,883	31,692	3,894	30,400	14,308	37,347	967	122,491	86,905	90,799	12,408	26	4	357	536
1986	1,894	81,639	3,463	26,127	13,290	37,012	661	164,086	78,984	82,447	26,330	12	13	130	748
1987	2,586	105,997	4,795	28,796	12,784	40,242	2,644	197,844	87,052	91,847	31,060	21	14	85	307
1988	2,656	135,781	6,867	27,043	10,876	40,980	3,788	227,991	85,343	92,210	32,334	23	41	55	260
1989	3,580	203,578	7,414	29,880	10,439	45,334	2,694	302,919	91,927	99,341	35,550	30	48	61	212
1990	2,932	175,685	8,115	27,701	9,179	43,265	1,813	268,690	84,890	93,005	24,553	19	101	34	153
1991	3,167	200,594	21,040	30,515	9,496	35,282	2,978	303,072	81,438	102,478	19,064	21	103	52	169
1992	1,883	148,186	56,127	24,796	9,360	37,000	3,255	280,607	76,294	132,421	35,710	35	65	27	217
1993	2,200	91,640	42,108	22,107	8,145	38,252	3,483	207,935	74,187	116,295	22,451	51	105	33	252
1994	2,834	162,923	73,611	19,284	7,661	35,361	3,638	305,312	68,778	142,389	14,981	133	66	71	179
1995	1,700	98,376	74,967	19,706	7,951	32,171	2,135	237,006	63,663	138,630	11,342	136	42	187	142
1996	1,790	123,419	85,127	20,807	8,339	30,487	2,559	272,528	63,982	149,109	13,800	178	54	264	150
1997	1,652	142,726	87,410	19,508	7,951	25,576	2,271	287,094	56,958	144,368	17,456	263	79	177	201
1998	506	142,810	88,601	16,722	4,410	22,619	2,180	277,848	46,437	135,038	4,342	257	117	197	223
1999	441	139,940	83,637	20,213	6,660	16,408	1,627	268,926	45,349	128,986	12,404	185	93	632	220
2000	145	120,411	85,843	16,315	6,296	11,702	1,498	242,210	35,956	121,799	14,653	121	81	705	223
2001	156	99,875	73,475	13,863	5,646	7,806	1,427	202,248	28,898	102,373	17,595	92	95	161	331
2002	205	84,494	45,808	13,220	3,830	5,974	2,115	155,646	25,344	71,151	25,302	99	79	215	422
2003	166	86,212	55,336	14,160	5,451	4,136	2,154	167,615	26,067	81,402	13,874	3	73	225	399
2004	114.6	120,735	96,504	13,726	5,848	3,340	2,770	243,037	25,799	122,302	8,969	1.6	100.7	27.48	450.7
2005	139.4	151,002	108,746	14,957	6,344	3,365	1,455	286,008	26,260	135,006	10,860	0.4	122.4	25.46	447.4
1981-1998 Avg	1,999	117,589	44,741	22,631	9,323	30,523	2,123	223,936	61,938	109,046	17,859	85	60	168	299
1991-2005 Avg	1,140	127,556	71,889	18,660	6,893	20,632	2,370	249,139	49,694	121,583	16,187	105	85	200	268
1998-2005 Avg	234	118,185	79,744	15,397	5,561	9,419	1,903	230,442	32,514	112,257	13,500	95	95	273	340

NOTE: For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-2 c Total domestic shoreside landings and at-sea deliveries, (ex-vessel revenues-Inflation

Year	Lingcod	Whiting, At Sea	Whiting, Shoreside	Flatfish	Sablefish	Rockfish	Other Groundfish	Total Groundfish	Total Groundfish Less Whiting	Total Groundfish Less At Sea Whiting	Pink Shrimp	Spot Prawn, Trawl	Spot Prawn, Pot	Ridgeback Prawn, Trawl	Pacific Halibut
1981	2,651	19,564	225	23,663	8,388	35,635	1,208	91,332	71,545	71,770	32,159	1,244	61	263	656
1982	3,353	19,048	292	31,674	16,509	42,516	1,116	114,506	95,167	95,458	22,925	1,302	140	252	695
1983	3,613	20,219	294	28,052	12,165	37,606	837	102,787	82,273	82,567	15,427	585	21	223	1,273
1984	3,368	18,102	626	25,229	10,307	34,096	982	92,710	73,982	74,608	6,979	335	2	504	1,704
1985	3,401	7,028	867	28,277	16,032	35,243	874	91,723	83,828	84,695	14,642	372	71	733	1,861
1986	1,976	15,867	676	26,071	16,436	38,415	717	100,160	83,617	84,293	46,345	177	175	350	3,724
1987	3,172	21,621	979	32,789	19,794	45,816	2,874	127,046	104,445	105,425	68,622	299	260	308	1,843
1988	3,093	32,480	1,644	30,100	18,091	42,442	3,244	131,094	96,970	98,614	42,161	347	643	223	1,601
1989	3,939	41,634	1,524	29,203	15,364	45,734	2,234	139,631	96,474	97,998	40,722	306	716	250	1,228
1990	3,228	31,836	1,479	24,322	13,619	45,811	1,386	121,681	88,366	89,845	37,466	224	1,552	142	1,276
1991	3,467	33,068	3,381	29,977	20,219	40,808	2,355	133,274	96,825	100,206	33,026	313	1,678	209	1,520
1992	2,243	24,920	8,162	22,817	18,908	43,848	2,549	123,447	90,365	98,527	37,853	601	1,218	182	1,438
1993	2,523	9,666	3,886	20,051	13,682	44,466	2,425	96,699	83,146	87,032	22,516	834	2,112	191	1,329
1994	3,235	17,277	6,552	17,461	18,665	47,846	2,703	113,741	89,910	96,462	25,821	2,289	1,336	283	1,213
1995	2,215	13,416	10,293	20,224	31,112	52,092	2,265	131,619	107,909	118,204	23,806	2,498	882	626	890
1996	2,341	17,492	6,567	20,055	33,299	43,467	2,494	125,715	101,657	108,224	23,365	3,315	1,085	999	982
1997	2,171	23,949	10,183	17,870	34,782	34,789	2,550	126,293	92,161	102,344	18,994	4,643	1,541	861	1,112
1998	869	16,390	5,866	15,150	13,777	30,262	3,567	85,881	63,624	69,491	6,116	4,476	2,251	923	961
1999	836	13,711	8,036	15,998	20,003	23,972	2,979	85,534	63,789	71,823	14,996	3,137	1,844	1,807	1,125
2000	391	12,346	9,039	15,857	23,053	19,733	2,993	83,412	62,027	71,067	14,689	2,475	1,854	2,034	1,371
2001	436	11,908	6,476	14,232	19,731	14,512	2,205	69,501	51,116	57,593	11,597	1,919	2,146	599	1,661
2002	562	10,128	5,042	13,136	13,116	12,290	2,904	57,180	42,009	47,052	17,057	1,949	1,768	703	2,019
2003	446	11,321	5,983	14,231	19,972	8,312	2,850	63,115	45,810	51,794	8,304	66	1,629	732	2,494
2004	449	10,037	8,022	13,286	17,628	7,096	3,228	59,297	41,238	49,261	7,917	2	105	28	2,738
2005	461	17,438	12,558	13,961	20,233	6,490	2,420	73,100	43,103	55,662	10,410	0	122	25	2,485
1981-2005 Avg	2,178	18,819	4,746	21,748	18,595	33,332	2,238	101,619	78,054	82,801	24,157	1,348	1,008	538	1,568
1991-2005 Avg	1,510	16,204	7,336	17,621	21,212	28,666	2,699	95,187	71,646	78,983	18,431	1,901	1,438	680	1,556
1998-2005 Avg	556	12,910	7,628	14,481	18,439	15,334	2,893	72,127	51,590	59,218	11,386	1,753	1,465	856	1,857

NOTE: Inflation adjustment used is the U.S. GDP Deflator (http://www.bea.gov/bea/dn/home/gdp.htm). For 1981-1990, at-sea whiting catch estimates are from Council 1997.

Table 7-3 Overfished Species Ranking by Sector and Area

		OVERFISHED SPECIES						
AREA	SECTOR	BCCCIO	CANARY	COWCD	D'BLTCH	POP	WIDOW	Y'EYE
N 40 10	LE FG-DOGFISH		ML					MH
	LE FG-NEARSHORE		ML					MH
	LE FG-SABLEFISH		ML					MH
	LE B-TRAWL-DEEP		ML		HIGH	HIGH		
	LE B-TRAWL-SHELF		HIGH					
	LE MW-TRAWL-WHITING		HIGH		ML	ML	HIGH	
	OA FG-DOGFISH		ML					MH
	OA FG-NEARSHORE		MH					MH
	OA FG-SABLEFISH		ML					MH
	WA REC P.HALIBUT		ML					HIGH
	WA REC BOTTOMFISH		ML					HIGH
	OR REC P. HALIBUT		MH					HIGH
	OR REC BOTTOMFISH		MH					HIGH
	CA REC BOTTOMFISH		ML					ML
38 - 40 10	LE FG-NEARSHORE	ML	ML					
	LE FG-SABLEFISH	ML	ML					
	LE B-TRAWL-DEEP	ML	ML		MH			
	LE B-TRAWL-SHELF	HIGH	MH					
	OA FG-NEARSHORE	ML	ML					
	OA FG-SABLEFISH	ML	ML					
	CA REC. BOTTOMFISH	ML	MH					ML
36 - 38	LE FG-NEARSHORE	ML	ML	ML				
	LE FG-SABLEFISH	ML	ML	ML				
	LE B-TRAWL-DEEP	ML	ML					
	LE B-TRAWL-SHELF	HIGH	ML	MH				
	OA FG-NEARSHORE	ML	ML	ML				
	OA FG-SABLEFISH	ML	ML	ML				
	CA REC. BOTTOMFISH	ML	MH					ML
S 36	LE FG-NEARSHORE	ML		ML				
	LE FG-SABLEFISH	ML		ML				
	LE B-TRAWL-DEEP	ML						
	LE B-TRAWL-SHELF	HIGH		MH				
	OA FG-NEARSHORE	ML		ML				
	OA FG-SABLEFISH	ML		ML				
	CA REC BOTTOMFISH	HIGH		ML				

Table 7-4a. Port Engagement in Groundfish Sectors in Areas North of 40°10' N Latitude

		SECTOR								
AREA	PORT	LE B-TRAWL-DEEP	LE B-TRAWL-SHELF	LE FG-DOGFISH	LE FG-NEARSHORE	LE FG-SABLEFISH	LE MW-TRAWL-WHITING	OA FG-DOGFISH	OA FG-NEARSHORE	OA FG-SABLEFISH
N 40 10	ABERDEEN									?
	ASTORIA	?	?		?	?	?			?
	BANDON									?
	BELLINGHAM BAY	?	?	?		?		?		?
	BLAINE	?	?	?		?				
	BROOKINGS	?	?			?			?	?
	CATHLAMET					?				
	CHARLESTON (COOS BAY)	?	?			?	?		?	?
	CHINOOK					?				?
	CRESCENT CITY	?	?		?	?	?		?	?
	DEPOE BAY								?	
	EUREKA	?	?			?	?		?	?
	EVERETT					?				
	FIELDS LANDING									?
	FLORENCE									?
	GARIBALDI (TILLAMOOK)					?			?	?
	GOLD BEACH								?	
	ILWACO					?	?			?
	LAPUSH					?				?
	MILL CREEK								?	
	NEAH BAY	?	?			?				?
	NEWPORT	?	?			?	?		?	?
	PACIFIC CITY								?	
	PORT ANGELES					?				?
	PORT ORFORD				?	?			?	?
	PORT TOWNSEND									?
	SEATTLE						?			?
	TOKELAND									?
	TRINIDAD								?	
	WESTPORT	?	?			?	?			?
	WINCHESTER BAY					?				?

Table 7-46 Ex-vessel Price and Fuel Cost Trends

Inflation Adjusted Ex-vessel, Fuel Prices, and Revenues per Bottom Trawl Hour

	Whiting	Flatfish	Sablefish	Rockfish	Total Groundfish	Revenue/hour	Fuel
	$/lb	$/lb	$/lb	$/lb	$/lb	$/hr	$/gallon
1999	$0.04	$0.36	$1.36	$0.66	$0.64	$264.25	$0.93
2000	$0.05	$0.44	$1.66	$0.76	$0.78	$285.99	$1.17
2001	$0.04	$0.47	$1.59	$0.84	$0.80	$260.69	$1.21
2002	$0.05	$0.45	$1.55	$0.93	$0.75	$249.48	$0.97
2003	$0.05	$0.46	$1.66	$0.91	$0.80	$311.24	$1.12
2004	$0.04	$0.44	$1.37	$0.96	$0.73	$351.13	$1.70
2005	$0.05	$0.42	$1.45	$0.87	$0.74	$345.3[e/]	$2.20

Change in Prices Relative to 1999

	Whiting	Flatfish	Sablefish	Rockfish	Total Groundfish	Bottom Trawl Revenue/hour	Fuel
1999	100%	100%	100%	100%	100%	100%	100%
2000	125%	122%	122%	115%	122%	108%	126%
2001	100%	131%	117%	127%	125%	99%	130%
2002	125%	125%	114%	141%	117%	94%	104%
2003	125%	128%	122%	138%	125%	118%	120%
2004	100%	122%	101%	145%	114%	133%	182%
2005	125%	117%	107%	132%	116%		236%

Ex-vessel Prices PacFIN

Fuel Prices-June Marine Fuel Prices, Newport as collected by PSMFC

Bottom Trawl Revenue/Hour Fished, NMFS NWR-Burden (12/2005)

All prices deflated to 2005

[e/]: preliminary estimate (logbook data not complete)

Table 7-62a Commercial Ex-vessel Projections by Major Sector

Ex-vessel Revenue (million $)	2005	No Action	Alternative 1	Alternative 2	Alternative 3	Council Preferred Alternative
Total West Coast Exvessel Revenue (including at-sea and tribal)	279.4	279.5	254.4	270.2	277.4	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)	64.4	64.2	40.6	56.1	62.5	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)	47.5	47.2	27.2	42.4	48.5	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting	33.5	32.5	19.4	31.5	34.3	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting	22.2	21.1	13.4	23.2	23.4	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)	25.2	26.1	13.8	19.2	25.1	
LE Fixed Gear Groundfish Exvessel Revenue	10.7	10.7	8.2	8.4	8.4	
Open Access Groundfish Exvessel Revenue	6.3	6.3	5.1	5.4	5.6	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)	4.8	5.2	4.5	4.5	4.8	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)	2.6	2.6	1.8	2.0	2.6	
Change compared to No Action (million $)						
Total West Coast Exvessel Revenue (including at-sea and tribal)			- 25.1	- 9.3	- 2.1	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)			- 23.7	- 8.1	- 1.7	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)			- 20.0	- 4.8	+ 1.3	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting			- 13.1	- 0.9	+ 1.9	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting			- 7.7	+ 2.1	+ 2.3	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)			- 12.3	- 6.9	- 1.0	
LE Fixed Gear Groundfish Exvessel Revenue			- 2.5	- 2.3	- 2.3	
Open Access Groundfish Exvessel Revenue			- 1.2	- 1.0	- 0.8	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)			- 0.7	- 0.7	- 0.4	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)			- 0.7	- 0.5	+ 0.0	
Change compared to No Action (%)						
Total West Coast Exvessel Revenue (including at-sea and tribal)			-9.0%	-3.3%	-0.8%	
Non-Tribal Groundfish Exvessel Revenue (including at-sea)			-36.9%	-12.6%	-2.7%	
Total LE Trawl Groundfish Exvessel Revenue (including at-sea)			-42.4%	-10.3%	+2.7%	
Shoreside LE Trawl Groundfish Exvessel Revenue Including Whiting			-40.3%	-2.9%	+5.8%	
Shoreside LE Trawl Groundfish Exvessel Revenue Excluding Whiting			-36.6%	+9.9%	+11.0%	
LE Trawl Whiting Exvessel Revenue (shoreside and at-sea)			-47.0%	-26.5%	-3.9%	
LE Fixed Gear Groundfish Exvessel Revenue			-23.3%	-21.3%	-21.2%	
Open Access Groundfish Exvessel Revenue			-18.7%	-15.3%	-12.0%	
Tribal Groundfish Shoreside Exvessel Revenue (including whiting)			-14.2%	-12.5%	-7.5%	
Tribal Groundfish At-Sea Exvessel Revenue (whiting)			-28.3%	-21.2%	+0.0%	

Table 7-65a Projected Recreational Effort by Region in 2004 and 2005 and by Alternative

n	2004	2005	No Action	Alt 1	Alt 2	Alt 3
Washington Coast	52,055	46,978	46,978	33,793	36,456	42,029
& Central WA Coast	145,568	125,737	125,737	125,737	125,737	125,737
ia-Tillamook	58,251	40,764	41,794	37,073	41,794	41,794
ort	72,331	55,368	58,487	46,177	58,487	58,487
Bay	50,990	36,238	39,152	35,175	39,152	39,152
ings	35,382	34,128	35,817	27,008	35,817	35,817
ent City-Eureka	47,314	60,292	47,133	42,035	47,133	47,133
ragg	52,197	66,162	45,684	36,678	39,153	48,594
ja Bay - San Francisco	108,659	82,922	87,127	56,185	59,618	92,772
rey - Morro Bay	120,830	99,709	114,155	72,564	74,411	138,561
Barbara	108,104	64,964	67,401	52,335	58,836	72,775
ngeles - San Diego	786,589	500,488	507,907	464,355	483,195	523,296
L	1,638,269	1,213,750	1,217,372	1,029,116	1,099,789	1,266,147

Table 7-68f Summary of estimated income impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (million $).

Region	No Action	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	15.40	13.37	14.89	14.96	
North Washington Coast	16.62	15.02	15.45	15.83	
	121.08	110.10	114.58	120.04	
Astoria-Tillamook	97.22	89.10	96.20	97.88	
Newport	49.70	39.35	45.45	48.88	
Coos Bay	32.39	29.29	32.12	32.44	
Brookings	17.72	16.21	17.50	17.57	
Crescent City-Eureka	19.40	16.34	19.32	19.73	
Fort Bragg	11.32	8.88	10.93	11.65	
Bodega Bay - San Francisco	43.69	39.51	40.37	44.27	
Monterey - Morro Bay	37.72	32.39	33.69	39.59	
Santa Barbara	62.58	61.34	61.92	62.90	
Los Angeles - San Diego	144.15	140.47	142.21	145.05	
TOTAL	669.01	611.38	644.62	670.80	

Table 7-68g Change (from No Action) in estimated income impacts resulting from combined recreational angler expenditures and commercial fisheries landings by region under the management alternatives (million $).

Region	*No Action*	Alt 1	Alt 2	Alt 3	Council Preferred Alt
Puget Sound	*15.4*	-2.0	-0.5	-0.4	
North Washington Coast	*16.6*	-1.6	-1.2	-0.8	
South & Central WA Coast	*121.1*	-11.0	-6.5	-1.0	
Astoria-Tillamook	*97.2*	-8.1	-1.0	0.7	
Newport	*49.7*	-10.4	-4.3	-0.8	
Coos Bay	*32.4*	-3.1	-0.3	0.0	
Brookings	*17.7*	-1.5	-0.2	-0.2	
Crescent City-Eureka	*19.4*	-3.1	-0.1	0.3	
Fort Bragg	*11.3*	-2.4	-0.4	0.3	
Bodega Bay - San Francisco	*43.7*	-4.2	-3.3	0.6	
Monterey - Morro Bay	*37.7*	-5.3	-4.0	1.9	
Santa Barbara	*62.6*	-1.2	-0.7	0.3	
Los Angeles - San Diego	*144.2*	-3.7	-1.9	0.9	
TOTAL	*669.01*	-57.63	-24.39	1.78	

Table A.4-18 Commercial Indicators and Rankings by County

County	Total Number of Vessels Participating in Any Fishery in 2005 by County	Rank	Dealers	Rank	Permits as percentage of state total	Rank	Groundfish permits a percentage of state total	Rank	County fish revenue/ Coastwide fish revenue	Rank	County groundfish revenue/ County fish revenue	Rank	County groundfish revenue/ Coastwide groundfish revenue	Rank
Alameda County					1.4%	25	1.5%							
Benton County					0.1%									
Butte County					0.2%		0.3%							8
Clackamas County					0.5%		1.6%	19						
Clallam County	115		15		0.6%		1.4%		1.3%		0.9%	5	2.5%	
Clark County					0.2%		0.1%							
Clatsop County	274	6	28		3.6%	11	3.7%	11	7.3%	3	1.2%	3	18.2%	
Columbia County					0.4%									
Contra Costa County					1.2%		0.4%							
Coos County	399	2	40	11	2.9%	15	2.9%	13	4.7%	8	0.9%	7	8.2%	
Cowlitz County					0.3%									
Curry County	194	10	27		3.6%	10	9.5%	2	2.4%		0.9%	6	4.2%	
Del Norte County	134		20		3.3%	12	5.7%	4	4.1%	10	0.3%		2.2%	
Deschutes County					0.1%									9
Douglas County	75		23		0.6%		0.4%		0.5%		0.1%		0.1%	
El Dorado County					0.2%									
Fresno County					0.2%									
Grays Harbor County	280	4	46	8	2.4%	17	2.0%	18	5.8%	6	0.8%	8	9.0%	
Hood River County					0.1%									
Humboldt County	135		37	12	4.2%	8	4.1%	9	3.7%	11	0.7%		5.0%	
Island County					0.2%		0.2%							
Jackson County					0.1%									
Jefferson	45		6		0.2%				0.2%		0.0%		0.0%	
Josephine County					0.1%									
Kern County					0.3%		0.3%							
King County	114		22		1.6%	22	5.1%	6	2.8%		0.1%		0.4%	
Kitsap County					0.2%		0.5%							
Klamath County					0.1%		0.1%							
Lake County					0.2%									
Lane County	18		14		0.6%		0.3%		0.2%		0.0%		0.0%	
Lewis County					0.3%		0.5%							
Lincoln County	464	1	79	1	3.2%	13	4.5%	8	6.4%	5	1.3%	2	16.9%	
Los Angeles County	145		50	6	5.1%	5	2.3%	16	8.2%	1	2.0%	1	0.8%	1
Marin County	149		37	12	2.0%	19	0.9%		1.5%		0.0%		0.1%	
Marion County					0.3%		0.4%							
Mason County	7		2		0.1%		0.1%		*		*		*	
Mendocino County	275	5	51	5	5.2%	3	6.1%	3	3.3%		0.6%		4.0%	
Monterey County	183		41	10	4.3%	7	3.5%	12	1.7%		0.2%		1.2%	
Multnomah County					0.4%		0.1%							
Nevada County					0.1%		0.1%							
Okanogan County							0.2%							
Orange County	145		50	6	3.0%	14	4.7%	7	8.2%	2	0.0%		0.8%	
Pacific County	246	7	30		2.0%	20	0.9%		4.3%	9	0.4%		3.1%	6
Pierce County	32		10		0.7%		0.4%		0.4%		0.0%		0.0%	
Placer County					0.2%									
Polk County					0.1%		0.3%							

Table A.4-29 Resiliency Indicator Values and Rankings by County

County	Industry diversification index (Shannon-Weiner Index)	Rank	Total population	Rank	Unemployment rate	Rank	Poverty rate	Rank
Alameda	2.50		1443741		3.6		11	
Clallam	2.25	9	64525	15	3.9		12.5	
Clark	2.38		345238		4		9.1	
Clatsop	2.15	4	35630	10	4.1		13.2	
Columbia	2.06	2	43560	11	4.1		9.1	
Contra Costa	2.50		948816		3.1		7.6	
Coos	2.36		62779	14	4.6	12	15	7
Cowlitz	2.29	13	92948		4.7	11	14	13
Curry	2.27	11	21137	6	3.6		12.2	
Del Norte	2.22	7	27507	9	4.9	7	20.2	1
Douglas	2.31	15	100399		4.3		13.1	
Grays Harbor	2.26	10	67194	16	4.8	10	16.1	5
Hood River	2.30	14	20411	4	4.4	16	14.2	12
Humboldt	2.28	12	126518		5.2	3	19.5	2
Island	2.27	11	71558	17	3		7	
Jefferson	2.25	9	25953	8	3.6		11.3	
King	2.55		606024		3.5		6.9	
Kitsap	2.27	11	231969		3.5		8.8	
Lane	2.36		322959		4.1		14.4	8
Lincoln	2.17	6	44479	12	4.9	8	13.9	14
Los Angeles	2.48		9519338		5	6	17.9	3
Marin	2.44		247289		1.9		6.6	
Mason	2.35		49405	13	4.5	14	12.2	
Mendocino	2.30	14	86265		4.5	15	15.9	6
Monterey	2.42		401762		5.2	5	13.5	16
Multnomah	2.55		660486		4.4		12.7	
Orange	2.52		2846289		3.3		10.3	
Pacific	2.14	3	20984	5	3.9		14.4	9
Pierce	2.39		700820		4.1		10.5	
San Diego	2.47		2813833		3.6		12.4	
San Francisco	2.47		776733		3		11.3	
San Joaquin	2.41		563598		6.2	2	17.7	4
San Juan	2.38		14077	3	1.9		9.2	
San Luis Obispo	2.38		401762		5.2	4	13.5	15
San Mateo	2.53		707161		2.2		5.8	
Santa Barbara	2.46		399347		4.2		14.3	10
Santa Cruz	2.41		255602		4.1		11.9	
Skagit	2.17	6	102979		4.3		11.1	
Skamania	2.03	1	9872	2	7.1	1	13.1	
Snohomish	2.30	14	606024		3.5		6.9	
Solano	2.33	16	394542		3.8		8.3	
Sonoma	2.39		458614		2.8		8.1	
Thurston	2.33	16	207355		3.9		8.8	
Tillamook	2.23	8	24262	7	2.6		11.4	
Ventura	2.43		753197		3.4		9.2	
Wahkiakum	2.16	5	3824	1	4.5	13	8.1	
Whatcom	2.36		166814		4.9	9	14.2	11

Note: Blank spaces in the rankings columns indicate that this county did not score in the top one-third.

Table A.4-33 Commercial and Recreational Scores and Identification of Vulnerable Counties

	Number of times the county scored in top one-third of commercial fishing engagement indicators	Number of times the county scored in top one-third of commercial groundfish dependency indicators	Number of times the county scored in top one-third (least resilient) of resiliency indicators	Vulnerable Area
County				
Alameda County	1			
Benton County				
Butte County		1		
Clackamas County		1		
Clallam County		**1**	**2**	**vulnerable**
Clark County				
Clatsop County	**3**	**2**	**2**	**vulnerable**
Columbia County			2	
Contra Costa County				
Coos County	**4**	**2**	**3**	**most vulnerable**
Cowlitz County			3	
Curry County	**2**	**2**	**2**	**vulnerable**
Del Norte County	**2**	**1**	**4**	**vulnerable**
Deschutes County		1		
Douglas County			1	
El Dorado County				
Fresno County				
Grays Harbor County	**4**	**2**	**4**	**most vulnerable**
Hood River County			4	
Humboldt County	**3**	**1**	**3**	**most vulnerable**
Island County			2	
Jackson County				
Jefferson			2	
Josephine County				
Kern County				
King County	1	1		
Kitsap County			1	
Klamath County				
Lake County				
Lane County			1	
Lewis County				
Lincoln County	**4**	**2**	**4**	**most vulnerable**
Los Angeles County	**3**	**3**	**2**	**vulnerable**
Marin County	2			
Marion County				
Mason County			2	
Mendocino County	**3**	**1**	**3**	**most vulnerable**
Monterey County	**2**	**1**	**2**	**vulnerable**
Multnomah County				
Nevada County				
Okanogan County				
Orange County	3	1		
Pacific County	**3**	**1**	**3**	**most vulnerable**
Pierce County				
Placer County				
Polk County				
Riverside County				
Sacramento County				
San Benito County				
San Bernardino County				
San Diego County	3	1		
San Francisco Bay County	2			
San Joaquin County			2	
San Juan County		**1**	**1**	**vulnerable**
San Luis Obispo County	**2**	**1**	**2**	**vulnerable**

Recreational	Current Fishery 2005OY	2006OY	Alternatives Action I	Action 2	Action 3	%change from 2006 OY Action I	Action 2	Action 3
Total Bottomfish Rec Trips	538929	538603	350690	421271	587873	-35%	-22%	9%
WA Bottomfish Rec Trips	44054	44054	31212	33782	39600	-29%	-23%	-10%
OR Bottomfish Trips	87403	92208	62392	92208	92208	-32%	0%	0%
CA Bottomfish Trips	407472	402341	257086	295281	456065	-36%	-27%	13%
Total Angler Expenditures bottomfish (Million $)	47	47	34	41	58	-27%	-12%	24%
West Coast-Total Rec Trips	1213750	1217372	1029116	1099789	1266147	-15%	-10%	4%
West Coast-Total Angler Expenditures (million $)	105	113	92	99	118	-18%	-12%	4%

Bottomfish are projections of groundfish and halibut trips combined.
West Coast -all species including groundfish, salmon, etc.

	Current Fishery 2005OY	2006OY	Alternatives Action I	Action 2	Action 3	%change from 2006 OY Action I	Action 2	Action 3
Groundfish Ex-vessel Revenues-Non-Tribal including at-sea (million $)	64	64	41	56	63	-37%	-13%	-3%
Groundfish Ex-vessel Revenue-Tribal including at-sea (Million $)	7	8	6	7	7	-19%	-17%	-5%
Total Ex-vessel Revenue Groundfish (Million $)	72	72	47	63	70	-35%	-13%	-3%
Total West Coast (groundfish and non-groundfish-Million $)	279	280	254	270	277	-9%	-3%	-1%
Nearshore groundfish ($1000)	2847	2847	2257	2791	2847	-21%	-2%	0%
LE Bottom Trawl ($1000)	21969	21969	12982	22868	23145	-41%	4%	5%
LE Whiting ($1000)	29652	29652	17293	23135	30146	-42%	-22%	2%
FG Sablefish N CP ($1000)	14387	14387	8723	8723	8723	-39%	-39%	-39%
FG Sablefish S 34 27 ($1000)	2137	2137	1517	2137	2137	-29%	0%	0%

	Current Fishery 2005OY million $	2006OY	Alternatives Action I Million $	Action 2	Action 3	%change from 2006 OY Action I	Action 2	Action 3
Personal Income-Groundfish-Non-tribal including at-sea	139.4	140.0	83.8	118.4	136.9	-66%	-15%	-3%
Groundfish Personal Income Tribal including at-sea	19.8	20.2	15.8	16.9	19.9	-25%	-15%	1%
Groundfish Personal Income-Tribal including at-sea	159.2	160.2	99.6	135.3	156.8	-38%	-16%	-2%
Total West Coast (groundfish and non-groundfish)	624.1	625.2	567.0	602.0	621.8	-10%	-4%	0%
Total recreational bottomfish	37.3	43.4	27.2	32.8	47.1	-37%	-12%	36%
Total West Coast recreational	82.8	89.0	72.8	78.3	92.7	-14%	-5%	14%
Total Groundfish-Commercial and Recreational-including at-sea	196.5	203.6	126.8	168.1	203.9	-40%	-12%	4%
Total West Coast-Commercial and Recreational-including at-sea	706.9	714.0	611.4	644.6	670.2	-14%	-10%	-6%

California Department of Fish and Game (CDFG) Report on Rockfish Conservation Area Management Alternatives for 2007-2008 Groundfish Management

Cowcod Conservation Area (CCA) Perimeters

Options for Consideration

The California Department of Fish and Game (CDFG) has received requests from both commercial and recreational fishermen to modify the boundaries of the Cowcod Conservation Area (CCA) for 2007-2008. Recreational fishermen have requested a modification to the inner perimeter to allow access to additional fishing areas nearshore. Commercial fixed gear fishermen have requested access to deeper waters within the current CCA boundaries to restore access to former slope rockfish target opportunities, primarily for blackgill rockfish.

Background and Purpose of CCA

The Cowcod Conservation Area (CCA) closures in the area south of 34°27’ N. latitude were established in 2001 in response to an overfished determination for the cowcod rockfish stock, and a federal requirement to restore the population to a healthy status. The intent of the CCAs was to reduce the cowcod catch so that the rebuilding Optimum Yield/Total Allowable Catch (OY/TAC) will not be exceeded. Rebuilding analyses suggest that recovery would be jeopardized if rebuilding OY/TACs are exceeded by any significant amount. The cowcod stock was reassessed in 2005, which indicated that cowcod biomass size is in slightly better shape than the last assessment (18% versus 7% of unfished biomass). This was reflected in a higher Conception area ABC for 2007-2008, though results of the new rebuilding analysis confirm suggestions from previous analysis that rebuilding of cowcod may take several decades. A new series of annual rebuilding OY/TACs have been calculated for future years, beginning in 2007-2008.

The CCA closures are primarily located far offshore where cowcod catches and catch rates remained historically high, but where total groundfish effort had been much lower than for fishing grounds closer to the mainland shore. Therefore, the CCA closures were initially adopted because they were less disruptive to southern California fisheries than alternative measures that would have been applied across the board to all shelf fishing grounds. These area closures were established prior to the implementation of depth-based RCAs along the coast that provided new protection to the primary depths of overfished shelf species, such as cowcod. The biggest difference between the RCAs and the CCAs was that the CCAs were expected to remain unchanged for many years based on the need to keep cowcod mortality within the rebuilding limits from the first stock assessment, although they were never intended to serve as reserves or marine protected areas (MPAs). Given that the recent assessment shows a more optimistic rebuilding picture, this proposal provides consideration for adjustment of the CCA boundaries.

When the CCAs were first established, enforcement concerns dictated the outer boundaries to be long, straight lines rather than following irregular depth contours so that enforcement by aircraft could be effective. This resulted in inclusion of deep water (slope) habitat in the closure, where cowcod are less commonly found, and thus access to slope fishing grounds was omitted. Since the CCA's adoption, an electronic Vessel Monitoring System (VMS) has been adopted by the Pacific Fishery Management Council (PFMC) for commercial groundfish vessels, which is intended to provide effective enforcement without the need for long straight boundaries for offshore area closures. VMS should allow for more effective enforcement of irregular offshore boundaries. And, the overly-precautionary area management should be able to accommodate some risk of bycatch on the deeper fringes of cowcod depth distribution. .

Outer CCA Perimeter Alternatives

For the 2007-2008 management cycle, alternative outer boundaries for the CCAs are proposed for consideration, to preserve the original intent of maintaining cowcod fishing mortality levels within the rebuilding OY/TAC while restoring fishing access to target species generally outside of cowcod depth zones for non-trawl vessels only. Prior to implementation of the CCAs, the area was accessed by vessels fishing with hook and line gear to target primarily blackgill rockfish, along with other slope rockfish.

Three alternatives to status quo are presented for consideration.

<u>Option 1 (= "Action Alternative 2" Chapter 2, DEIS): modify depth boundaries to allow fishing deeper than 175 fm.</u>

For non-trawl vessels that employ VMS, the CCA closure areas would be limited to the primary depth range that is utilized by cowcod, which would remove current bottom fishing restrictions from a large area of fishing grounds that are too deep to be considered primary cowcod habitat. Alternative 1 redefines the CCA outer perimeters as a series of waypoints that fall within (or beyond) the cowcod depth range, centering on the 175 fathom contour. This alternative refines the area management of cowcod intended when the CCA was established while preserving the original intent of the CCA with less impact to fisheries for other healthy stocks. Some additional considerations would be necessary to provide effective enforcement for this alternative:

- Only vessels with VMS would be eligible to fish between the current CCA boundaries and the new outer perimeter lines. For all vessels except those carrying VMS, the current boundaries and restrictions for the CCAs would be maintained.
- CDFG enforcement of Alternative 1 waypoints would rely on timely access to VMS information, and the ability to use that information in state court to prosecute violations. Without VMS access, or federal enforcement of boundaries, effective enforcement and thus management integrity could not be ensured.
- Vessels intending to fish using Alternative 1 boundaries would be required to declare their intent prior to departure from port for each trip.
- End buoys for longline sets would be required to employ radar reflectors and strobe lights. Also, the practicality of employing transponders (or other technologies) similar to VMS for the end buoys would be considered as a regulatory requirement.

Option 2 (= "Action Alternative 1", Chapter 2, DEIS): establish specific rockfish fishing areas within the CCA.

Four deep-water rockfish fishing areas (RFAs) within the existing CCA boundaries would be specified for commercial fishing with hook and line gear. This is similar to Alternative 1, except areas open to fishing would be limited to fishing grounds within four new defined RFAs and, within those RFAs, to areas that are deeper than the 175 fathom contour, as approximated by a series of waypoints within the RFA polygons. All other conditions would be as specified under Alternative 1. The limited number of fishing locations in Alternative 2 are intended to improve enforceability of the regulations compared to Alternative 1 while providing some access to slope target species deeper than habitat preferred by cowcod.

Option 3 (= "Action Alternative 3" Chapter 2, DEIS). Eliminate the CCAs and employ depth-based management under normal Rockfish Conservation Area (RCA) regulations.

This alternative would provide for management of the CCA areas as part of the routine groundfish management process. Any depth and area restrictions would be developed and adopted under the RCA regulations, which are currently closed to 150 fm in the area south of 34°27' N latitude.

Option 4. Status quo (no action alternative)

Maintain the current boundaries and restrictions for the CCAs. This alternative provides boundaries that have been shown to be easily understandable to fishers and enforcement. Conservation for cowcod and other overfished groundfish that are found within the area is achieved. However, fishing opportunities previously afforded to fixed gear vessels for target slope species are not realized.

Analysis of Impacts for Outer Perimeter Alternatives

Available depth distribution information for cowcod and blackgill rockfish are provided in Table 4-1 in Chapter 4 of the 2007-2008 DEIS contained in the June 2006 Briefing Book. The provided depth range of highest cowcod density is 100 -130 fm with an overall depth range of 22 - 203 fm. Depth distribution information for blackgill, the primary slope target species, is 125 - 300 fm for common depth (or highest density). While there is some overlap of the proposed open depths with the deeper ranges where cowcod has been observed, all of the outer perimeter alternatives would be expected to maintain the total cowcod catch within the rebuilding OY for 2007-2008. Prior to adoption of the CCA, less than ten vessels fished for blackgill rockfish in these areas. While CDFG recognizes there is no way to predict the likelihood of increased open access opportunity in areas reopened to the hook and line fishery under these alternatives, few open access vessels currently participate in slope rockfish fishing in areas open outside the non-trawl RCA boundaries.

All of the Outer Perimeter Alternatives would be expected to maintain the total cowcod catch within the rebuilding OY for 2007/2008. In 2000, an OY of 2.4 mt was established for the Conception area, which was roughly one-half the level of the total commercial catch from trawl and non-trawl vessels during the preceding years when there were few if any constraints on cowcod fishing. Since then, access to shelf habitat has been restricted by implementation of depth-based Rockfish Conservation Areas (RCAs), and the cowcod bycatch mortality has been coming in under the current rebuilding OY of 2.1 mt.. The majority of catch has come from the trawl sector north of Pt. Conception, which currently has a separate OY of 2.1 mt. When comparing current catch estimates from the non-trawl commercial sectors to the OYs combined from both areas are 0.2 mt, representing 5% of the two area OYs combined (=4.2mt). For 2007-08, the Council-preferred OY alternatives combine the two OY management areas for a single OY that includes a near-status quo level and a higher level (4.0 mt or 8.0 mt for both areas combined). The trawl and non-trawl RCAs have provided protection of cowcod in addition to the CCA and total catch for cowcod in all commercial and recreational sectors has successfully reduced impact to approximately 20% below the current OYs, with an RCA boundary at 150 fm. A combination of 150 fm RCA boundaries and maintained CCA closure in waters less than 175 fm (under Action Alternatives 1 and 2) should therefore preserve successful management of bycatch levels of cowcod rockfish below the proposed low OY option for 2007-08. From a biological perspective, any of the alternatives to status quo meet the intent of the CCAs; however, from an implementation perspective, the option contained in Option 2 (Action Alternative 1) best achieves enforcement goals. Relative to concerns expressed over the potential impact on continued fishery-independent research within the CCA, a new survey using submersibles to survey cowcod within the CCA was conducted and used as a survey source in the 2005 cowcod stock assessment. Some areas contained in alternatives may overlap with survey areas, although we have not compared to actual transect locations. Depending on the alternative chosen, CDFG recognizes that it might affect comparability of the one past survey with future surveys repeated in the area.

The actual impact to cowcod of any changes could be evaluated in the future to consider whether the blackgill fishery should continue in that areas, if new observer data from fishing deeper than 175 fm in the CCA became available. While the West Coast Groundfish Observer Program was implemented after the closure of the CCA, observations south of Pt. Conception have been minimal to this point.

Inner CCA Perimeter Alternatives

For 2007-08, constituents have requested the opportunity for recreational fishing deeper than the currently-specified 20 fm depth closure.

Alternative 1: Extend fishing depth from 20 fm to 30 fm.

Alternative 2: Extend fishing depth from 20 fm to 40 fm.

Sub-options for Alternatives 1 and 2: Consider allowing retention of shelf rockfish species

Alternative 3 (CDFG preferred alternative): Status quo (no action). Maintain the current boundaries and depth and species restrictions for the CCAs.

Analysis of Impacts from Inner Perimeter Alternatives

The current 0-20 fathom shallow fishing opportunity within the CCA is limited to nearshore species and does not provide for retention of shelf species. Both of these provisions were established to eliminate the risk of interactions with cowcod. Fishing deeper than 20 fathoms would not provide additional fishing opportunities unless we allowed retention of shelf species. .Allowing retention of shelf species would increase the likelihood that an unquantifiable amount of cowcod would be discarded, thus undermining the intent of the CCAs. Allowing increased fishing opportunities for the recreational and commercial fisheries in an area of expected cowcod interactions is not supportable given the continued low OY options. Therefore, the CDFG does not recommend any change from status quo for inner CCA boundaries.

Proposed Creation of Darkblotched Rockfish Conservation Areas (DRCAs) between 40°10' N latitude and 38° N latitude for Limited Entry Trawl Groundfish in 2007-2008

Background:
California Department of Fish and Game (CDFG) is proposing two areas for possible new Darkblotched Rockfish Rockfish Conservation Areas (DRCAs) between 40°10' N. latitude and 38° N. latitude. This area represents the southern end of the distribution of this rebuilding species. Although catch rates are lower in this area when compared to catch rates in the area north of 40°10' N. latitude, some large catches have occurred in past years, and as a result there is uncertainty in predictability of catches in this area. Slope rockfish represents an important target species group for trawl vessels operating in this area, and cumulative trip limits previously were the same from 40°10' N. latitude to the US/Mexico border. However, due to uncertainty relative to possible darkblotched rockfish in this area when targeting slope rockfish, cumulative trip limits have been reduced to a level intermediary between low levels N. of 40°10' and limits south of 38° N. latitude. Available data was analyzed to evaluate whether specific areas of higher concentration (i.e., catch-per-unit-effort) could be identified for potential closure to provide a reasonable expectation of lower bycatch than current rates being assumed for the area.

Data Reviewed:
Data from several sources were reviewed through a collaborative effort between NMFS and CDFG. Fishery-independent data from the triennial, slope, and combined surveys were provided by AFSC and NWFSC, and analysis conducted by John Field, NMFS Santa Cruz and Jan Mason, NMFS Pacific Grove. Fishery-dependent location data were derived from trawl logbook data and analyzed by Jan Mason and Gerry Kobylinski, CDFG. Data from identified areas was compared to observer data from the West Coast Groundfish Observer Program (WCGOP) by Jim Hastie. A complete review of the analysis will be provided at the June Council meeting.

Proposal:
Five areas reflecting higher concentrations of darkblotched rockfish in one or more years from 2000-2005 were identified and analyzed. Of these, two areas appeared to have the greatest amount of overlapping data between data sources. WCGOP data did not conflict with these finding. Should the areas be adopted for use in 2007-2008 groundfish management, their appropriate application needs to be explored. The areas could be used year-round, or part of the year, or used when needed inseason. The two areas for consideration are as follows:

Alternative 1: DRCA at Spanish Canyon near Shelter Cove (Figure 1)

Coordinates for Area 1 (Map attached):

#	Latitude Degrees	Decimal Minutes	Longitude Degrees	Decimal Minutes
1	40	6.22	124	17.78
2	40	2.96	124	15.49
3	40	2.42	124	13.69
4	40	2.23	124	13.66
5	40	2.57	124	16.53
6	40	4.85	124	17.99
7	40	6.22	124	17.78

Alternative 3: DRCA west of Pt Arena (Figure 2)

Coordinates for area 3 are as follows (Map Attached):

#	Latitude Degrees	Decimal Minutes	Longitude Degrees	Decimal Minutes
1	38	56.36	123	59.33
2	38	56.98	123	56.73
3	38	53.7	123	56.35
4	38	50.07	123	53.6
5	38	50.02	123	55.32
6	38	56.36	123	59.33

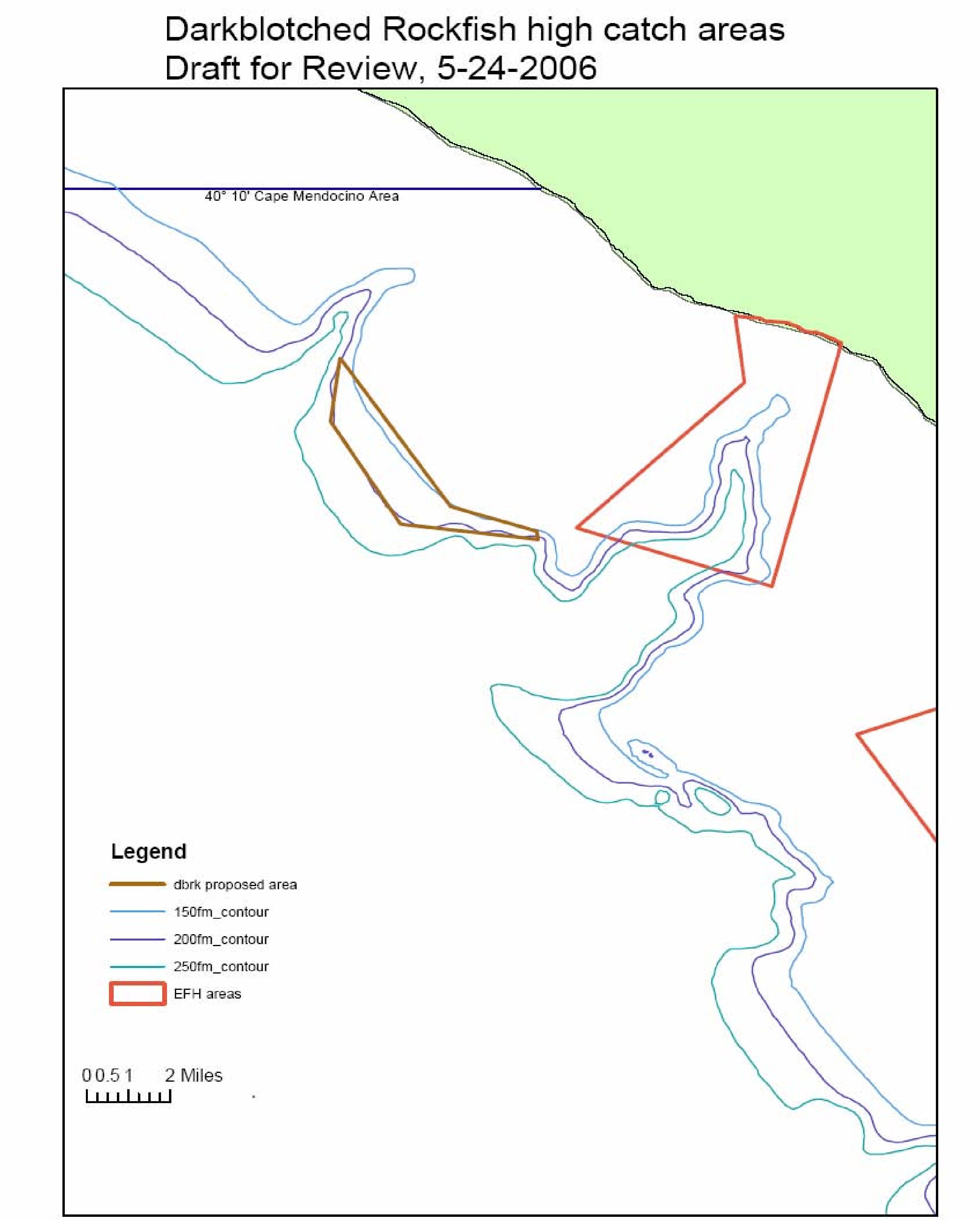


Figure 1. Proposed darkblotched RCA at Spanish Canyon near Shelter Cove.

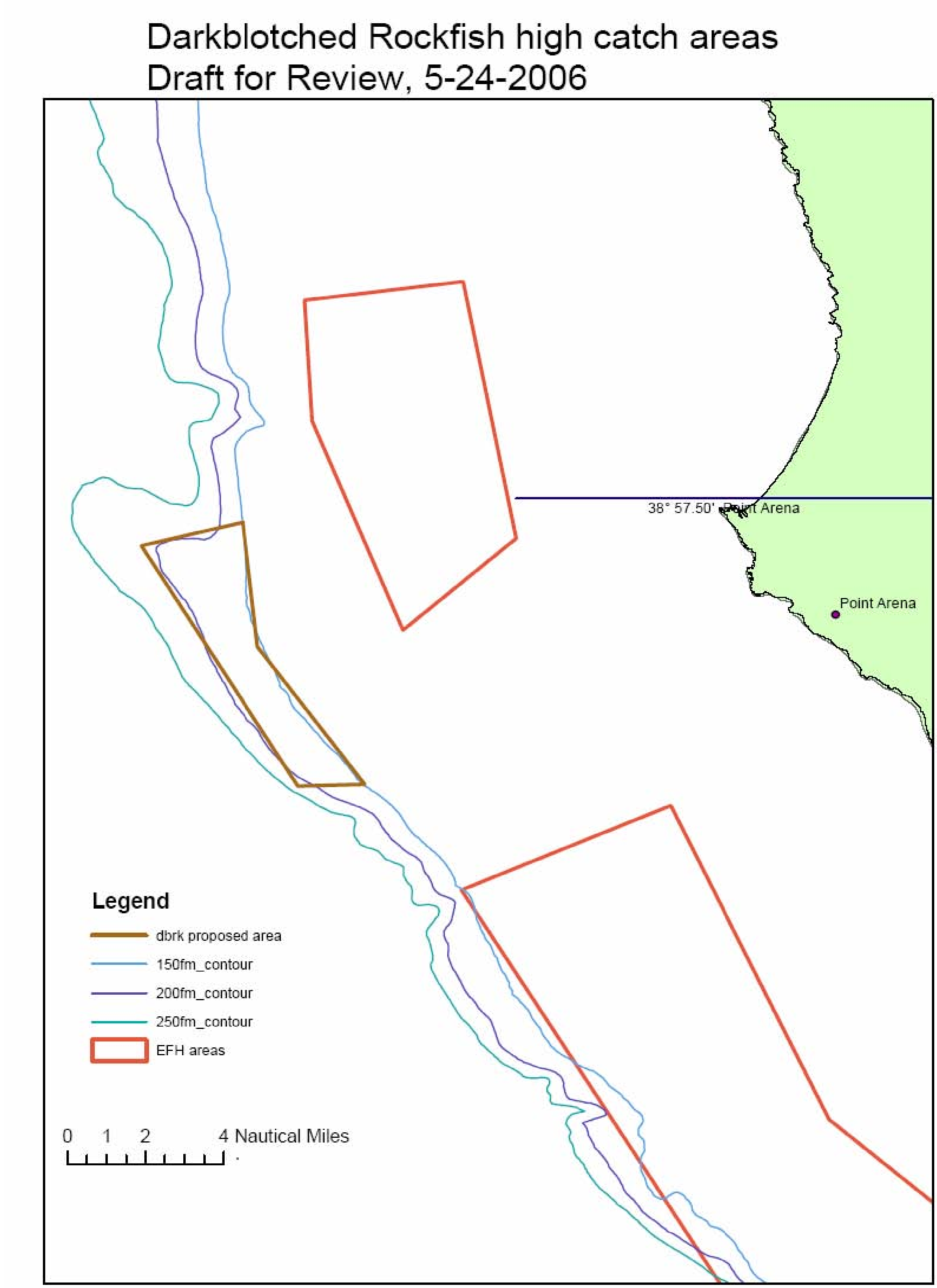


Figure 2. Proposed darkblotched RCA west of Point Arena.

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT SUMMARIZING PUBLIC COMMENT RECEIVED REGARDING 2007-2008 GROUNDFISH MANAGEMENT

The Oregon Department of Fish and Wildlife held a series of public meetings to gather public input on the range of management measures adopted by the Pacific Fishery Management Council for each of the 2007-2008 groundfish fisheries (commercial and recreational). Meetings were conducted coastwide on 4 consecutive days; beginning in Brookings, Oregon, and moving north to Coos Bay, Newport, and Astoria, and consisted of a joint session to discuss regulation setting processes and harvest levels, and break-out sessions to separately discuss the harvest levels and management measures specific to the recreational or commercial fisheries.

Recreational

Table 1 details the majority opinions from each meeting as well as a listing of individual comments regarding proposed recreational management measures for the 2007-2008 groundfish fisheries. Overall, attendees were very concerned about the proposed low level of yelloweye rockfish, and were adamant that the groundfish fishery would not be sustainable under the management structure of Action Alternatives 1a and 1b (Figure 1). If forced to determine a preference between Action Alternatives 1a and 1b, most felt that a reduction in the Pacific halibut fishery would have a less severe impact than a 2-month groundfish fishery.

Both the north and south coasts (Astoria and Brookings) preferred having a reduction in season duration over a reduction in the daily marine bag limit. The central coast (Coos Bay and Newport) preferred maintaining a year round fishery, though meeting attendees cautioned that reducing the marine fish daily bag limit further would greatly curtail fishing interest. Nearly all participants confirmed the desire to maintain a marine fish daily bag limit of no fewer than 5 fish.

Overall, attendees were supportive of creating a flatfish daily bag limit of 25 fish in aggregate, consisting of all soles and flounders except Pacific halibut. Currently, all flatfish except Pacific sanddab and Pacific halibut are managed within the marine fish daily bag limit.

Reactions to increased lingcod opportunity were mixed. There was no support for a minimum size limit of 20-inches, some support for a minimum size limit of 22-inches, and most support for the status quo minimum size limit of 24-inches. Most attendees did not endorse an increase in the lingcod daily bag limit, unless there were dramatic changes in either the season structure or depth restrictions.

Commercial

Bottom Trawl

Overall bottom trawl fishermen understood and accepted the rationale behind the suite of high, medium and low OY alternatives. At the low end (particularly for nearshore selective flatfish trawl) the level of trip limits presented might not even cover operational cost (high price of fuel). Deepwater fishermen were also concerned about high fuel costs, and indicated they might then elect to fish closer to home – which would increase nearshore trawl effort. An option to allow only one trawl net type per 2-month cumulative catch period is intended to prevent increased effort nearshore (which could result in early season closure). Fishermen were split regarding support for such an option. Bottom trawl fishermen also indicated that the trip limit ratios are not aligned with actual ratios of one species to another in actual catches, and will result in unnecessary discard. Dover sole trip limits should be increased relative to sablefish and petrale sole. Finally, some fishermen indicated that using state-wide or even region-wide estimates for bycatch mortality penalized fishermen that do not catch canary rockfish or yelloweye rockfish in their area. They felt that a move towards sub-regional, or even sub-state management would be a fair approach.

Midwater-trawl

No Pacific whiting fishery participants attended, and no comments were received.

Fixed-gear sablefish

Fixed-gear fishermen were universal in their belief that the sablefish OY was set too low. If Action Alternative 2 (fish outside 125 fm) or Action Alternative 1 (fish outside 150 fm) is implemented it should only apply to longline gear (pot bycatch is nearly non-existent compared to longline). Longline fishermen were not well represented. Fisherman understood that the FMP would need to be amended to make this change (separate pot and longline management options), but felt it would be worthwhile.

Nearshore Hook & Line

The majority felt that season structure and shallower depth restrictions would be preferable to reduced target species harvest levels. Fishing inside 20 fm was accepted by nearly all (a minority felt that 10 or 15 fm would be acceptable). Fishing in less than 20 fm during the winter was inadvisable because fish disperse and safety issues are a great concern.

Figure 1. Season structure along with expected yelloweye rockfish and canary rockfish impacts for various 2007-08 Oregon recreational fishery action alternatives, compared to the no action alternative.

<table>
<tr><th rowspan="2">Alternative</th><th colspan="13">Month</th><th rowspan="2">Marine Bag</th><th rowspan="2">Ling Bag</th><th rowspan="2">Ling Size</th><th rowspan="2">Yelloweye Impact (mt)</th><th rowspan="2">Canary Impact (mt)</th></tr>
<tr><th>J</th><th>F</th><th>M</th><th>A</th><th>M</th><th>J</th><th>J</th><th>A</th><th>LDay</th><th>S</th><th>O</th><th>N</th><th>D</th></tr>
<tr><td>1a</td><td colspan="6">CLOSED</td><td colspan="3">GF open <20 fm</td><td colspan="4">CLOSED</td><td>10*</td><td>3</td><td>20</td><td>1.6</td><td>1.6</td></tr>
<tr><td>1b</td><td colspan="3">CLOSED</td><td colspan="7">GF open <20 fm & Halibut fishery reduced by 30%</td><td colspan="3">CLOSED</td><td>6*</td><td>3</td><td>20</td><td>1.5</td><td>2.3</td></tr>
<tr><td>2</td><td colspan="13">GF open <20 fm</td><td>5*</td><td>2</td><td>22</td><td>1.9</td><td>2.6</td></tr>
<tr><td>3a</td><td colspan="5">GF open <40 fm</td><td colspan="3">GF open <25 fm</td><td colspan="5">GF open <40 fm</td><td>5**</td><td>2</td><td>22</td><td>2.5</td><td>3.7</td></tr>
<tr><td>3b</td><td colspan="13">GF open <40 fm</td><td>5**</td><td>2</td><td>22</td><td>2.9</td><td>4.0</td></tr>
<tr><td>No Action</td><td colspan="5">GF open all depth</td><td colspan="5">GF open <40 fm</td><td colspan="3">GF open all depth</td><td>6*</td><td>2</td><td>24</td><td>3.6</td><td>5.3</td></tr>
</table>

* Status quo marine bag species.

**Marine bag limit excludes flatfish which have a separate 25 fish daily bag limit.

Table 1. Major Sport Issues Discussed at Public Meetings reviewing 2007-08 Management Measures *

	Brookings	**Coos Bay**	**Newport**	**Astoria**
Number of Public Participants	8	6	10	6
Issues:				
Year round season	Suggest April 1 - October 15 fishery.	Year round fishery. Opposed to fishery inside of 40 fm all year (Action Alternatives 3a and 2 are not feasible).	Year round fishery at expense of offshore opportunity. No depth closure inside of 25 fm (Action Alternative 2 is not feasible).	Suggest March 15 - October 15 or April 1 -October 15. No depth closure inside of 25 fm (Action Alternative 2 is not feasible).
Marine bag limit		No less than 5 (or 6) marine bag.	No less than 5 marine bag.	Higher marine bag with less than year round season.
Separate flatfish bag limit	Yes (unanimous)	Yes. (concern for starry flounder and California halibut)	Yes. Less confusing for anglers as not need to identify species (except P. halibut) and less citations.	Yes, but maybe reduce bag limit from 25. Remain open year round.
Lingcod bag limit	2 (status quo)	If fishery open > 40 fm =2. If fishery open < 40 fm =2 or 3.	If fishery open > 40 fm =2. If fishery open < 40 fm =2 or 3. Concern for increased yelloweye rockfish impacts.	If year round season =2. If reduced season and/or reduced marine bag limit =3.
Lingcod minimum length (inches)	22 or 24 (most preferred status quo)	24	24	22
Reduce Pacific halibut season to achieve longer groundfish season of at least six months	Not an issue in this area (little P. halibut opportunity)	Neither reduced Pacific halibut opportunity (Action Alternative 1b) or 2 month groundfish season (Action Alternative 1a) are feasible. Action Alternative 1b would have less impact to the fishery.	Neither reduced Pacific halibut opportunity (Action Alternative 1b) or 2 month groundfish season (Action Alternative 1a) are feasible. Action Alternative 1b would have less impact to the fishery.	Neither reduced Pacific halibut opportunity (Action Alternative 1b) or 2 month groundfish season (Action Alternative 1a) are feasible.

Other Related Proposals/ Issues	1. Weekly or annual limits on rockfish (tags?) 2. Regional mgt within OR on nearshore species (north vs south coast)	1. Allow incidental take of lingcod in P. halibut fishery (especially if Stonewall Bank is closed). 2. Regional mgt within OR. 3. Manage yelloweye rf on state status (regional).	Viable economic impact statement needed to address various options and effect on fishing industry, coastal economy, and state.	Columbia R. subarea would like an increase in the OR/CA sport P. halibut allocation as they have little incidental yelloweye rf impacts.

* Comments reflect majority opinion. All were informed the shore fishery would be managed for a year round season as yelloweye rf and canary rf are not impacted in the shore fishery.

Individual or minority observations on Major Sport Issues by Port

Year round season (Confirm: year round fishery at expense of offshore opportunity and reduced marine bag)

- Newport
  - Values fish more in winter
  - March - October 15 season
  - Move the fishery inside 15-fathoms all year and avoid yelloweye rockfish
  - No less than 5 fish marine bag limit
  - No less than 8 fish marine bag limit
- Coos Bay
  - No less than 6 fish marine bag limit
  - No less than 5 fish marine bag limit
- Brookings
  - A few participants favored year round season
  - March should be left open as lingcod fishing is good
  - Inseason closures and bag limit changes discourages anglers from coming to the coast
  - The is a good biological reason for closing in winter as lingcod are guarding nests

Lingcod bag limit

- Astoria
  - Leave it alone for a few years
  - Ask for 3 fish bag to negotiate from
- Newport
  - Concerned that increasing the lingcod bag limit may result in increased yelloweye rockfish catch
  - Increase lingcod catch so as to reduce abundance and overall predation on rockfish
  - Concern over the effect of raising the bag limit on the abundance status of lingcod in 10 years
  - Close the winter fishery except allow 3 lingcod and implement gear size restrictions
- Coos Bay

- Let's get something back (3 fish)
- Leave it at 2 fish
- Adopt tag with either 12 or 24 fish per year
- Will allowing 3 lingcod increase the rockfish impact?
- Brookings
  - One angler preferred 3 fish bag

Lingcod minimum length (inches)

- Astoria
  - Leave it alone for a few years
  - Ask for 20-inches to negotiate from
- Newport
  - Why would we want to reduce the minimum size limit? No less than 24 inches!
- Brookings
  - How about reinstating the upper length limit on lingcod?
  - One angler recommended a 22-inch minimum length
  - Enforcement representative (Oregon State Police) felt that a change in lingcod minimum length would cause confusion

Separate flatfish bag limit

- Newport
  - Increased opportunity
  - One participant opposed

Reduce Pacific halibut season to achieve longer groundfish season of at least 6 months

- Astoria
  - July through Labor Day fishery inside of 20-fathoms is not feasible
  - Newport needs to find a way of reducing yelloweye rf impacts or else reduce catch in Newport and allow increased halibut catch in other area
- Newport
  - We can afford to loose 30% of the P. halibut quota
  - July through Labor Day fishery inside of 20-fathoms is not feasible
  - Increase Stonewall RCA, allow troll gear only and restrict weight to avoid catching yelloweye rockfish
  - Several participants suggest allowing fishing for salmon in RCA with halibut on vessel
  - Impacts are in Stonewall Banks area and need to be reduced by RCA or gear restrictions. Suggest enlarged RCA and consider troll gear (barbless hooks, weight limits?)
- Coos Bay
  - July through Labor Day fishery inside of 20-fathoms is not feasible
  - Close Stonewall Banks or find other method to maintain longer groundfish season. Troll gear only in Stonewall Banks may result in lingcod and halibut targeting and thus incidental yelloweye rf catch
  - Two halibut bag limit may reduce rockfish impacts.

Other Comments

- Newport

- Add a subsistence definition allowing the estuary boat fishery to be open year round
- Brookings
  - Need clarification in the regulations on when a gaff may be used
  - Commercial crab pots near port are a gear conflict with sport salmon trolling
  - Is ODFW spending money on inland fisheries that comes from ocean fisher's licenses?
  - Use rockfish tag dollars for rockfish assessments
  - Concerned about sea lion predation on rockfish (especially yelloweye rockfish)

Table 2. Major Commercial Issues Discussed at Public Meetings reviewing 2007-08 Management Measures

May, 2006

	Brookings	**Coos Bay**	**Newport**	**Astoria**
Number of Public Participants	11	4	3	8
Issues:				
LE Trawl				
Trawl Trip Limits		Dover / Sablefish ratios create sablefish discard. Dover limits should be higher		Alternative 1: Too much Dover will go to waste. Petrale limits should be lower than Dover. Better quality Dover in the summer. Alternative 2: Better than Alt. 1 but still want more Dover. Selective Flatfish gear can't go out to 100 fm; can catch the limit too quickly. May not get to Pacific Cod. Alternative 3: No canary bycatch by Astoria nearshore trawl.
Darkblotched Rockfish		Current regulations are causing a lot of discard mortality		
LE and OA Sablefish				
Sablefish Stock Assessment	Stock is healthy - assessment is wrong	Stock is healthy - assessment is wrong		Stock is healthy - assessment is wrong

Nearshore				
Reduced Black Rockfish Harvest Cap	A better idea is to eliminate gear that has higher bycatch of yelloweye (e.g., longline)		Work on season structure and depth restrictions rather than reduced harvest caps	
Shallower Depth Restriction	A 20 fm restriction was reasonable	Concerned over gear conflicts - Recreational Charter / OA H+L	15 or 20 fathoms OK during the summer. Not OK during the winter as fish disperse and there are safety concerns	
Increase Lincod Trip Limit	Yes	Yes - Dinglebar gear fishes lingcod cleanly	Yes - spawning period closure is inconsistent with management of other species (petrale sole)	
Lingcod Minimum Size Limit		Retain the 24" minimum.		
Open access sole limit should be more generous			Lots of sole available nearshore for open access trap gear	
Open Access				
Salmon Troll Lingcod Allowance		Yes		Concerned about Salmon trollers targeting Lingcod

Other Comments

Astoria

- Who is pushing to have longnose skates assessed and why?
- Why is the money from the overages, in particular hake, going to the state's general fund?
- The hake fishery's bycatch is impacting the bottom trawlers.
- Fishers using hook & line can easily avoid yelloweye so why are they being "punished" by the limitations of longline gear?

Newport

- Need more regional management - even subregions of a state
- Identify preferred gear (low bycatch) for nearshore fishery
- Yelloweye are not caught in traps
- Stock assessments for darkblotched rockfish and sablefish need to factor in mandatory excluder devices in the shrimp fishery.

Coos Bay

- Comment that sablefish traps fish cleaner than longline. Discussion of Amendment 6 and what it would take to separate out traps.

- Need to overhaul of trawl logbooks or all logbooks to make them ‘Total Catch’ logbooks more similar to Alaska.
- Petrale grounds in Southern Oregon haven’t been fished very hard in several years.
- Discussion about splitting the trawlers into two fleets: Big boat / Small boat or beach / deep?
- OA H+L is really two fleets. The lingcod fishermen 25-40 fm and the live fish boats <20 fm
- Low weights of shallow water yelloweye RF catch don’t reflect that it’s the recruitment (small/young) yelloweye being caught at shallow depths

Brookings

- Black rockfish OY is being stepped down while recruitment curve should be going up if current population models are accurate.
- Large foot rope bottom trawl net designed with an overhang and section of 5” (across diagonal) square mesh at cod end will drastically reduce if not eliminate the catch of small sablefish and rockfish

Agenda Item F.2.b
Supplemental CDFG Report
June 2006

Supplemental CDFG Report on Corrections to California Recreational Alternatives in Chapter 2.0 of the 2007-2008 Groundfish Management Specifications Draft EIS

Corrected text is submitted by CDFG on sections of Chapter 2.0 “Alternatives Including the Proposed Action” related to California recreational fishery alternatives. Underlined statements are additions and deleted items are in ~~strikeout~~.

2.2.3.1 The No Action Alternative

2.2.3.1.8 California Recreational Fisheries

For management of California’s nearshore recreational groundfish fishery in 2005 and 2006, the California Fish and Game Department (CDFG) divided the coastline into five regional areas, although some regions had the same management measures and were therefore managed as a larger combined region. The five management areas, termed Rockfish/Lingcod Management Areas (RLMAs), are as follows: 1) Southern RLMA (U.S./Mexico Border to Point Conception at 34°27' N latitude), 2) Southern South-Central RLMA (Point Conception to Lopez Point at 36° N latitude), 3) Northern South-Central RLMA (Lopez Point to Pigeon Point at 37º11’ N latitude), 4) Northern Central RLMA (Pigeon Point to Cape Mendocino at 40°10' N latitude), and 5) Northern RLMA (Cape Mendocino to the California/Oregon Border at 42° N latitude). The RLMAs between Lopez Point and Cape Mendocino were combined in 2005-2006 management with the intent to specify separate management measures in each of these RLMAs as needed to stay within state and federal harvest guidelines.

The Council and NMFS adopted 2005-2006 California recreational management measures as follows:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Lingcod size limit of 24 inches with a daily bag limit of two fish.
- Within a general bag limit of 20 fish, a combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish of which one can be a cabezon and one can be a greenling of the genus *Hexagrammos*[1].
- A two-fish bag limit for bocaccio in the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude) and a one-fish bag limit south of 40°10' N latitude to the U.S./Mexico border within the 10-fish RCG daily bag limit.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.

1 The cabezon daily bag sublimit was changed from three fish to one fish and the greenling daily bag sublimit was changed from 2 fish to 1 fish in a California Fish and Game Commission action in October 2004 subsequent to the Council’s final decision in June 2004. The Council and NMFS adopted conforming federal regulations that were implemented on April 1, 2005.

- All divers (use of boats is permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.

The California recreational fishery was managed with federal and state harvest guideline for various groundfish species. Federal annual harvest guidelines were specified for canary rockfish (9.3 mt), yelloweye rockfish (3.7 mt), black rockfish (316 mt for recreational and nearshore commercial fisheries combined in 2005, of which 175 mt were allocated to the recreational fishery by CDFG; in 2006, the combined harvest guideline was 309 mt and the recreational harvest guideline was 170 mt), and lingcod (422 mt) (Table 2-11). State harvest guidelines were specified by CDFG for cabezon, greenlings, and minor nearshore rockfish (both shallow and deeper nearshore rockfish species; see section 2.1.4.1 for the list of species in these complexes). If the recreational harvest guideline for canary rockfish, yelloweye rockfish, or lingcod specified for California was projected to be exceeded, or if the state harvest guideline for black rockfish was projected to be exceeded when combining recreational harvest projections and annual commercial projections, CDFG and/or the Council and NMFS would take action to close all or part of the recreational fishery in all or part of the state regions in all or part of the remainder of the year. Any closure may pertain to closure of specific groundfish species or specific depths in different regions to achieve catch limitation. In the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude), CDFG would take action to close all or part of the recreational fishery deeper than the 30 fm management line if the canary or yelloweye rockfish harvest guideline was attained early in the season.

The 2005 and 2006 adopted management measures included depth bands where fishing for rockfish and associated species was allowed only between 20 and 40 fm (Southern South-Central RLMA) or 30 to 60 fm (Southern RLMA). California took inseason action in 2005 to remove the shoreward boundaries of these depth bands and allow boat-based fishing inside the seaward boundaries originally adopted in the Southern and Southern South-Central RLMAs. These actions were initiated to address concerns related to the ability to enforce fishing restrictions shoreward of adopted depth bands. In addition, final 2004 recreational CRFS projections of impacts showed that additional opportunity could be allowed shoreward of the adopted boundaries, as well as in additional months in the North, North-Central and Northern South-Central RLMAs that would not be likely to exceed harvest guidelines for overfished species targets.

The 2005-2006 seasons and depth restrictions by California management region (Table 2-13) were as follows:

Table 2-13. Summary of 2006 California recreational groundfish seasons and depth restrictions by region under the No Action Alternative.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 30fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed					
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	---	> 40fm Closed					---	---	---
South Region	---	---	> 60fm Closed						>30 fm Closed		> 60fm Closed	

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

Southern RLMA (U.S./Mexico Border to Point Conception at 34°27' N latitude)

The California recreational groundfish fishery regulations south of Point Conception under the No Action Alternative were the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through August and November through December shoreward of 60 fm; open September through October shoreward of 30 fm; and closed January and February.
- California scorpionfish can only be retained during October and November shoreward of 40 fm and December shoreward of 20 fm (closed January through September).
- Fishing is allowed within the Cowcod Conservation Areas (Figure 2-3) shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

Southern South-Central RLMA (Point Conception to Lopez Point at 36° N latitude)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through September shoreward of 40 fm (closed January through April and October through December).

Northern South-Central RLMA (Lopez Point to Pigeon Point at 37°11' N latitude)

The California recreational groundfish fishery regulations for the area between Lopez Point and Cape Mendocino under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm (closed January through June).

Northern Central RLMA (Pigeon Point to Cape Mendocino at 40°10' N latitude)

Same regulations as in the Northern South-Central RLMA, except:

- Recreational fishing for groundfish prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.

Northern RLMA (Cape Mendocino to the California/Oregon Border at 42° N latitude)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the No Action Alternative would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 40 fm (closed January ~~through June~~ through April).

2.2.3.2 Action Alternative 1

2.2.3.2.8 California Recreational Fisheries

Under Action Alternative 1, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 1 include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- Within a general bag limit of 20 fish, a combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish, of which one can be a cabezon and one can be a greenling of the genus *Hexagrammos*.
- No retention of cowcod, canary, or yelloweye rockfish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- Recreational fishing for groundfish prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and

shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.
- Fishing is allowed within the Cowcod Conservation Areas shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

California recreational groundfish management measures that differ from status quo under Action Alternative 1 include the following:
- A statewide one-fish bocaccio sublimit is included in the 10-fish RCG daily bag limit.
- Lingcod daily bag limit of 1 fish, but with a minimum size limit of 22 inches.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 1 are described below and summarized in Table 2-17.
- ~~Fishing is allowed within the Cowcod Conservation Areas shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).~~

Table 2-17. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 1.

RCG SEASON BY REGION:

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 20fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed			---	> 20fm Closed	
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	---	> 20fm Closed					---	---	---
South Region*	---	---	> 30fm Closed									

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-February and 0-30 fm March-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 1 are the same as described above except for the following changes:
- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through December shoreward of the 30 fm line and otherwise closed.
- California scorpionfish is open year-round, but restricted to depths shoreward of 40 fm during January and February, and shoreward of 30 fm during March through December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 1 would be the same as described above except for the following changes:

• Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through September shoreward of the 20 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Pigeon Point under the Action Alternative 1 would be the same as described above except for the following changes:

• Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 1 would be the same as described above except for the following changes:

• Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through September and November through December shoreward of 20 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 1 would be the same as described above except for the following changes:

• Groundfish and ocean whitefish open in May through December shoreward of 20 fm and otherwise closed.

2.2.3.3.8 California Recreational Fisheries

Under Action Alternative 2, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 2 include the following:

• Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).

• The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.

• Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.

• Combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish.

• No retention of cowcod, canary, or yelloweye rockfish.

• Lingcod size limit of 24 inches with a daily bag limit of two fish.

• ~~A two-fish bocaccio sublimit included in the 10-fish RCG daily bag limit.~~

• A two-fish bag limit for bocaccio in the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude) and a one-fish bag limit south of 40°10' N latitude to the U.S./Mexico border within the 10-fish RCG daily bag limit.

- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- Recreational fishing for groundfish prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.
- Fishing is allowed within the Cowcod Conservation Areas shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

California recreational groundfish management measures that differ from status quo under Action Alternative 2 include the following:

- ~~Two~~ One cabezon and two greenling of the genus *Hexagrammos* sublimit is included in the 10-fish RCG daily bag limit.

Additionally, seasons and depth restrictions by RLMA under Action Alternative 2 are described below and summarized in Table 2-20.

Table 2-20. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 2.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	>30fm Closed							
North Central	---	---	---	---	---	---	> 20fm Closed					
South Central - Monterey	---	---	---	---	---	---	> 20fm Closed					
South Central - Morro Bay	---	---	---	> 20fm Closed						---	---	---
South Region*	---	---	> 40fm Closed						> 30fm Closed		> 60fm Closed	

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

LINGCOD SEASON IS OPEN **ONLY** WHEN RCG IS OPEN, EXCEPT CLOSED DEC, JAN, FEB, MAR FOR SPAWNING

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-August, 0-30 fm September-October and 0-60 fm November-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 2 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through August shoreward of the 40 fm line, September through October shoreward of the 30 fm line, November and December shoreward of the 60 fm line, and otherwise closed.

• California scorpionfish is open year-round, but restricted to depths shoreward of 40 fm during January-August, shoreward of 30 fm during September and October, and shoreward of 60 fm during November and December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 2 would be the same as described above except for the following changes:

• Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open April through September shoreward of the 20 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Cape Mendocino under the Action Alternative 2 would be the same as described above except for the following changes:

• Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 2 would be the same as described above except for the following changes:

• Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open July through December shoreward of 20 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 2 would be the same as described above except for the following changes:

• Groundfish and ocean whitefish open in May through December shoreward of 30 fm and otherwise closed.

2.2.3.4 Action Alternative 3

2.2.3.4.8 California Recreational Fisheries

Under Action Alternative 3, the five RLMAs described under the No Action Alternative will be used to manage 2007-2008 California recreational groundfish fisheries. The status quo (No Action) California recreational management measures under Action Alternative 3 include the following:

• Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).

• The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.

- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- ~~A two-fish bocaccio sublimit is included in the 10-fish RCG daily bag limit.~~
- No retention of cowcod, canary, or yelloweye rockfish.
- Lingcod size limit of 24 inches with a daily bag limit of two fish.
- ~~Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December~~.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- Recreational fishing for groundfish prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.
- Fishing is allowed within the Cowcod Conservation Areas shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish).

California recreational groundfish management measures that differ from status quo under Action Alternative 3 include the following:

- Combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish, of which ~~two~~ one can be a cabezon and two can be a greenling of the genus *Hexagrammos*.
- A two-fish bocaccio sublimit is included in the 10-fish RCG daily bag limit.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, and March.
- ~~Lingcod daily bag limit of 3 fish, but with a minimum size limit of 22 inches.~~

Additionally, seasons and depth restrictions by RLMA under Action Alternative 3 are described below and summarized in Table 2-23.

Table 2-23. Summary of 2007-2008 California recreational groundfish seasons and depth restrictions by region under Action Alternative 3.

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 40fm Closed							
North Central	---	---	---	---	---		> 40fm Closed					
South Central - Monterey	---	---	---	---	> 40fm Closed							
South Central - Morro Bay	---	---	---	> 40fm Closed							---	---
South Region*	---	---	> 60fm Closed									

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

Only half of month is open

*In the South Region, CA scorpionfish is open 12 months: 0-40 fm in January-February and 0-60 fm March-December.

Southern RLMA (U.S./Mexico Border to Point Conception)

The California recreational groundfish fishery regulations south of Point Conception under Action Alternative 3 are the same as described above except for the following changes:

- Groundfish other than California scorpionfish, but including select nongroundfish species (California sheephead and ocean whitefish) open March through December shoreward of the 60 fm line and otherwise closed.
- California scorpionfish open year-round, but restricted to depths shoreward of 40 fm in January and February, and shoreward of 60 fm during March through December.

Southern South-Central RLMA (Point Conception to Lopez Point)

The California recreational groundfish fishery regulations for the area between Point Conception and Lopez Point under Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open April through mid-October shoreward of the 40 fm line and otherwise closed.

Northern South--Central RLMA (Lopez Point to Pigeon Point)

The California recreational groundfish fishery regulations for the area between Lopez Point and Pigeon Point under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open May through December shoreward of 40 fm and otherwise closed.

Northern Central RLMA (Pigeon Point to Cape Mendocino)

The California recreational groundfish fishery regulations for the area between Pigeon Point and Cape Mendocino under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish including select nongroundfish species (California sheephead and ocean whitefish) open mid-June through December shoreward of 40 fm and otherwise closed.

Northern RLMA (Cape Mendocino to the California/Oregon Border)

The California recreational groundfish fishery regulations for the area between Cape Mendocino and the California/Oregon border under the Action Alternative 3 would be the same as described above except for the following changes:

- Groundfish and ocean whitefish open in May through December shoreward of 40 fm and otherwise closed.

CALIFORNIA DEPARTMENT OF FISH AND GAME REPORT ON THE TENTATIVE ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

Purpose

In consideration of management measures for the 2007-08 groundfish fishery, the Council has been provided with a substantial amount of economic analysis of alternative management measures. Much of this analysis is compared to the socioeconomic impacts resulting from 2005 and 2006 management. While action alternatives 1 and 2 show negative impacts compared to status quo, the analysis for action alternative 3 shows an increase in the number of recreational angler trips and personal income when compared to status quo, which is largely driven by California recreational fishery options (Agenda Item F.2.a Supplemental Attachment 5). This document is intended to provide a perspective on compounding effects of recent management decisions prior to the status quo season, that have been needed to substantially reduce impacts on overfished species. The CDFG recommends that the resulting cumulative economic impacts that lead to the 2005-06 status quo be kept in mind when considering specifications and management measure alternatives for 2007-08 relative to the status quo.

Past and Present

In 1998 the recreational fishery for rockfish, lingcod and associated species was much less regulated than it is under the Status Quo regulations (Table 2-13, Agenda Item F.2.a Attachment 1). California anglers enjoyed a 15 fish bag limit of rockfish within a 20 fish bag and a year round season. Fishing depths were unconstrained and anglers routinely fished as deep as 100 fms north of Point Conception to the Oregon border and to 120 fms south of Point Conception. This represented an effective area of 29,970 square kilometers available for fishing assuming all areas available were fished for these species (Figures 1 - 4). CDFG recognizes that not all available areas represent appropriate habitat for rockfish, lingcod and the associated species. Beginning in 1999, stricter regulations were adopted following the completion of the bocaccio stock assessment and an overfished status determination to minimize even recreational impacts on this species. Bocaccio are a shelf species found in depths greater than 20 – 40 fms and recreational anglers began losing fishing opportunities in deeper shelf waters.

Between 1998 and 2005, progressively restrictive season and depth changes and area closures were adopted to reduce impacts on overfished shelf species as they were identified, primarily bocaccio, canary rockfish, yelloweye rockfish, cowcod and lingcod. In 2000, the rockfish bag limit was reduced from 15 to 10 fish. In fact, in 2000 due to the number of overfished species and the need to further limit impacts, the West Coast Groundfish Fishery was declared an economic disaster. These changes moved anglers further inshore for more months and away from encounters with overfished shelf species increasing pressure on nearshore stocks as Rockfish Conservation Areas (RCAs) were implemented. To recognize the regional differences on individual overfished stocks and maximize fishing opportunities, the Rockfish and Lingcod Management Areas (RMLAs) were designated so that regulations could be more region specific. During the same period, additional areas were closed to recreational and commercial groundfish fishing when new Marine Protected Areas (MPAs) were adopted in state waters around the

Channel Islands and in the Cowcod Conservation Area (CCA) - also in southern California. An additional factor that contributed to the highly restricted recreational regulations in California was the reliance on the Marine Recreational Fisheries Statistical Survey (MRFSS) data for regulation development and inseason monitoring (not tasks for which the program was designed.) During this period, California's recreational regulations were routinely conservative due to the uncertainties of MRFSS data, the concerns over accuracy of the data, and the repeated need for inseason action when estimates indicated higher catches than expected.

By 2005, the maximum seasons and depths fished were eight months at ≤ 30 fms from the Oregon Border to Cape Mendocino, six months at ≤ 20 fm from Cape Mendocino to Lopez Point, five months at ≤ 40 fms from Lopez Point to north of Point Conception, and 10 months at ≤ 30 fm or ≤ 60 fm south of Point Conception (Figures 1 - 5).

All of the above changes resulted in a reduction of 62% to the area effectively open to California's recreational groundfish fishery by 2005. It also resulted in a reduction of between 17% and 58% of the season length.

Concentrating anglers into shallower waters limits their access to other rockfish species and focuses targeting on nearshore rockfish stocks. Because most of the nearshore species are managed as data-poor, this further constricts the fishery (Table2-CARecSQ).

Reasonably Foreseeable Future

Under Action Alternative 1, in 2007 and 2008 the remaining area open to the recreational groundfish fishery would be further reduced by 12% to increase protection on rebuilding species (Figures 1 - 4) and keep catches within lower harvest targets. This action would result in a 74% overall reduction in available fishing areas since 1998. The season would likely be limited to between five and eight months and maximum allowable depths of ≤ 20 or ≤ 30 fm depending on RLMA.

Fishable areas		
Year	Area (Sq Km)	% of Past 1998 Baseline
1998	29,970	100%
2005	11,472	38%
2007-08	7,890	26%

Direct/Indirect Effects

All reductions in seasons and depth limitations have had direct impacts on anglers including:

- Reductions in seasons have reduced overall opportunities,
- Reduced or eliminated opportunities for target species in deeper water (e.g. large "red" rockfish including bocaccio, yelloweye, canary, cowcod, copper or vermilion rockfish, and to some extent lingcod or associated species like chilipepper rockfish) have reduced participation.
- Direct effects of depth changes (via stricter RCA boundaries) on resources have included increased pressure on nearshore stocks when the status of many of these species is considered "data poor".

Indirect effects experienced by anglers include:

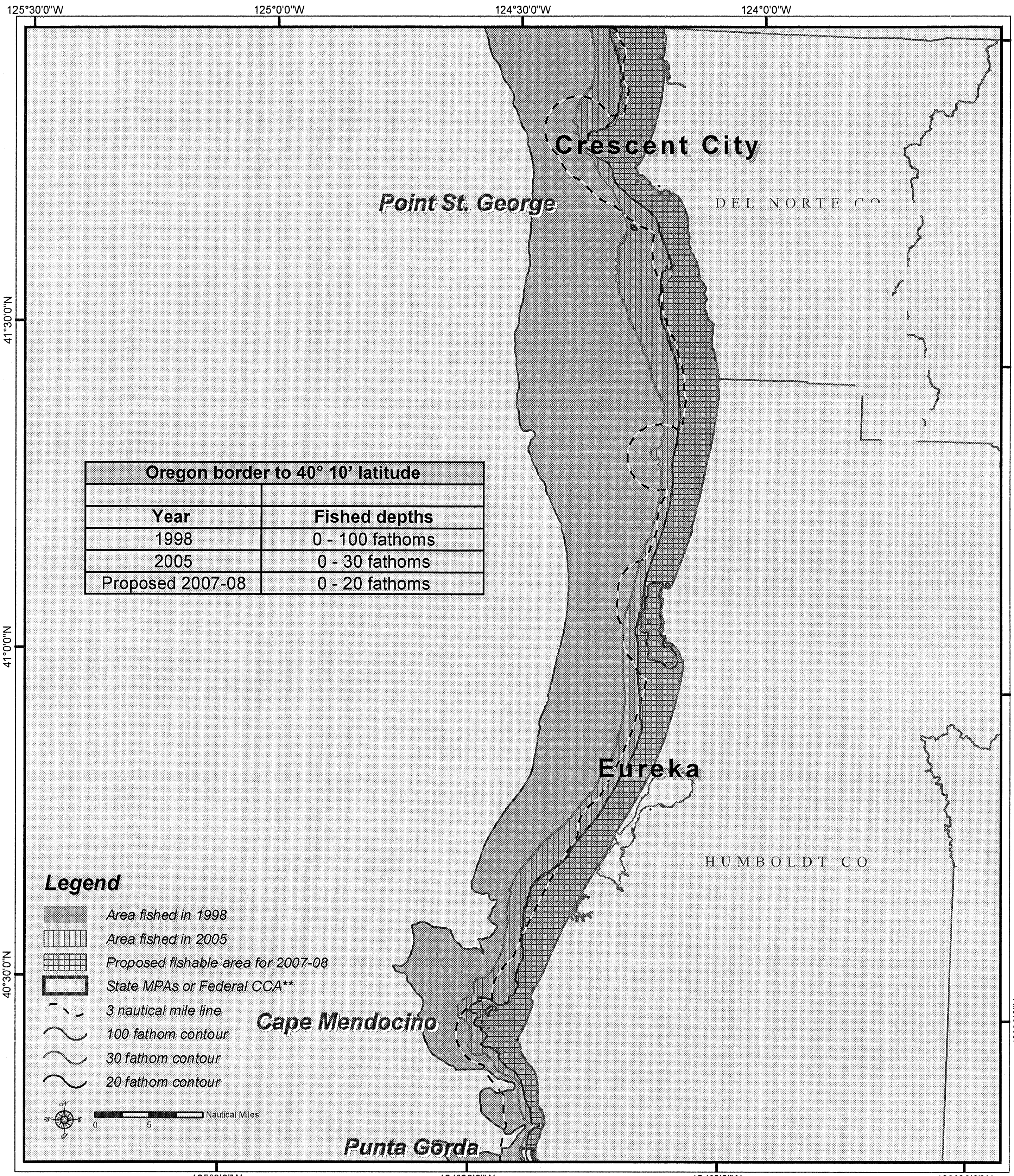
- Increased perception that "there are no fish left" or all species are over fished has also reduced participation.
- Confusion over changes in the regulations and/or resulting citations reducing participation,
- Greater difficulty in predicting fishing behavior leading to inseason closures which:
    - Create additional impacts on the sportfishing public
    - Reduce business for industry (loss of repeat customers)
    - Greater effort by enforcement staff to enforce changing regulations

Impacts on the recreational fishing industry:

- Less fishing trips with shorter seasons and less "target" species available
- Difficulty retaining qualified staff due to increased "down time" when their services are not needed
- Increased costs due to gear restrictions, greater advertising,

Impacts of Regulations on Recreationally Fished Areas for Rockfish and Associated Species

Change in fishable areas shown for 1998, 2005, and proposed 2007 - 08 based on RCA Alternative 1 (Low)



Oregon border to 40° 10' latitude	
Year	Fished depths
1998	0 - 100 fathoms
2005	0 - 30 fathoms
Proposed 2007-08	0 - 20 fathoms

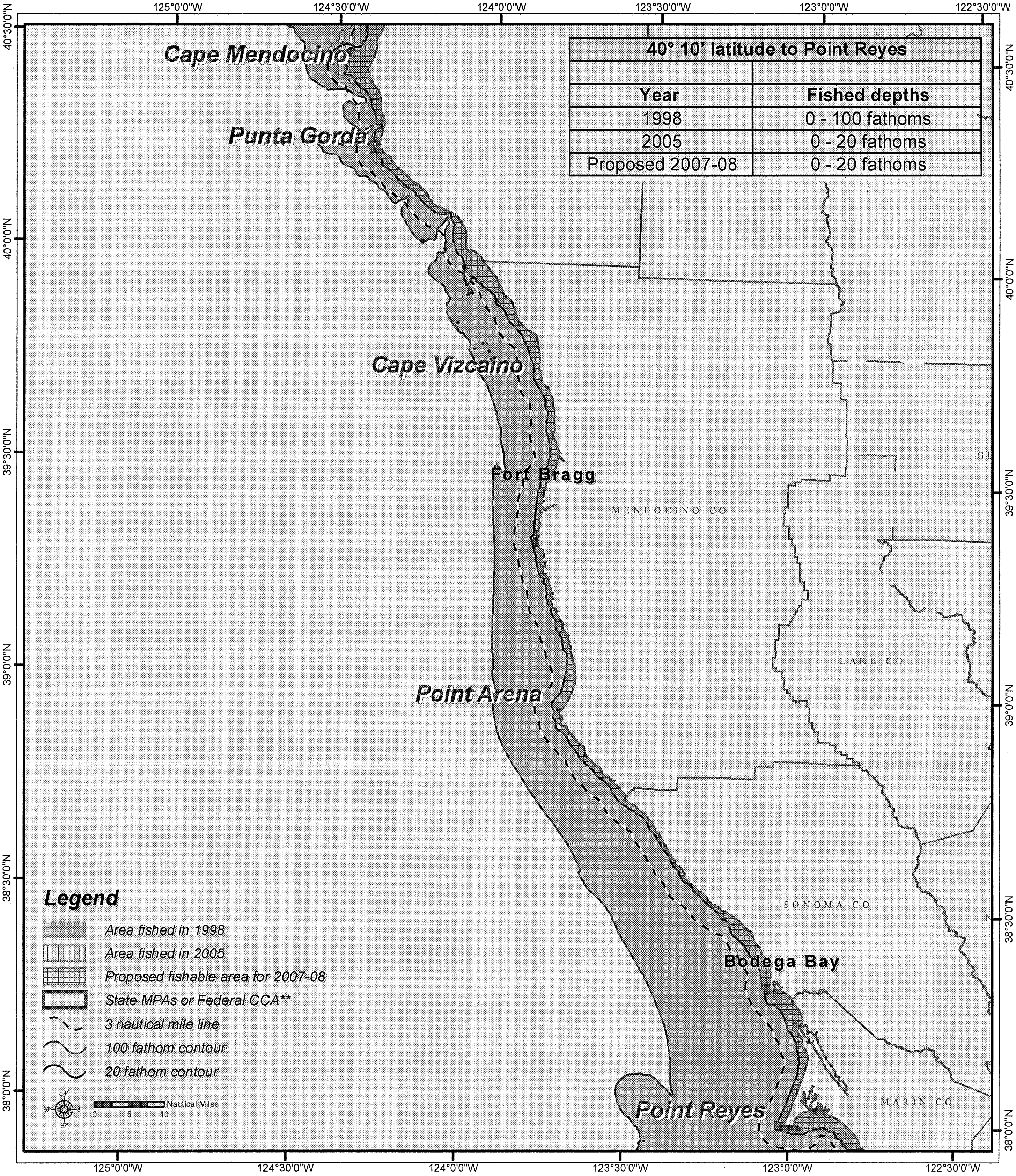
* Survey data suggest that in the past, fishing for rockfish, lingcod and associated species occurred in depths less than 100 fm north of Point Conception and less than 120 fm south of Point Conception.

** Marine Protected Areas (MPAs) or Cowcod Conservation Areas (CCAs) include areas less than 100 or 120 fathoms that were fished prior to their formal designations
(such as in 1998 when the 100 and 120 fathoms depth zones represented fished areas).

Prepared By
California Department of Fish and Game
Marine Region GIS
May 10, 2006

Impacts of Regulations on Recreationally Fished Areas for Rockfish and Associated Species

Change in fishable areas shown for 1998, 2005, and proposed 2007 - 08 based on RCA Alternative 1 (Low)



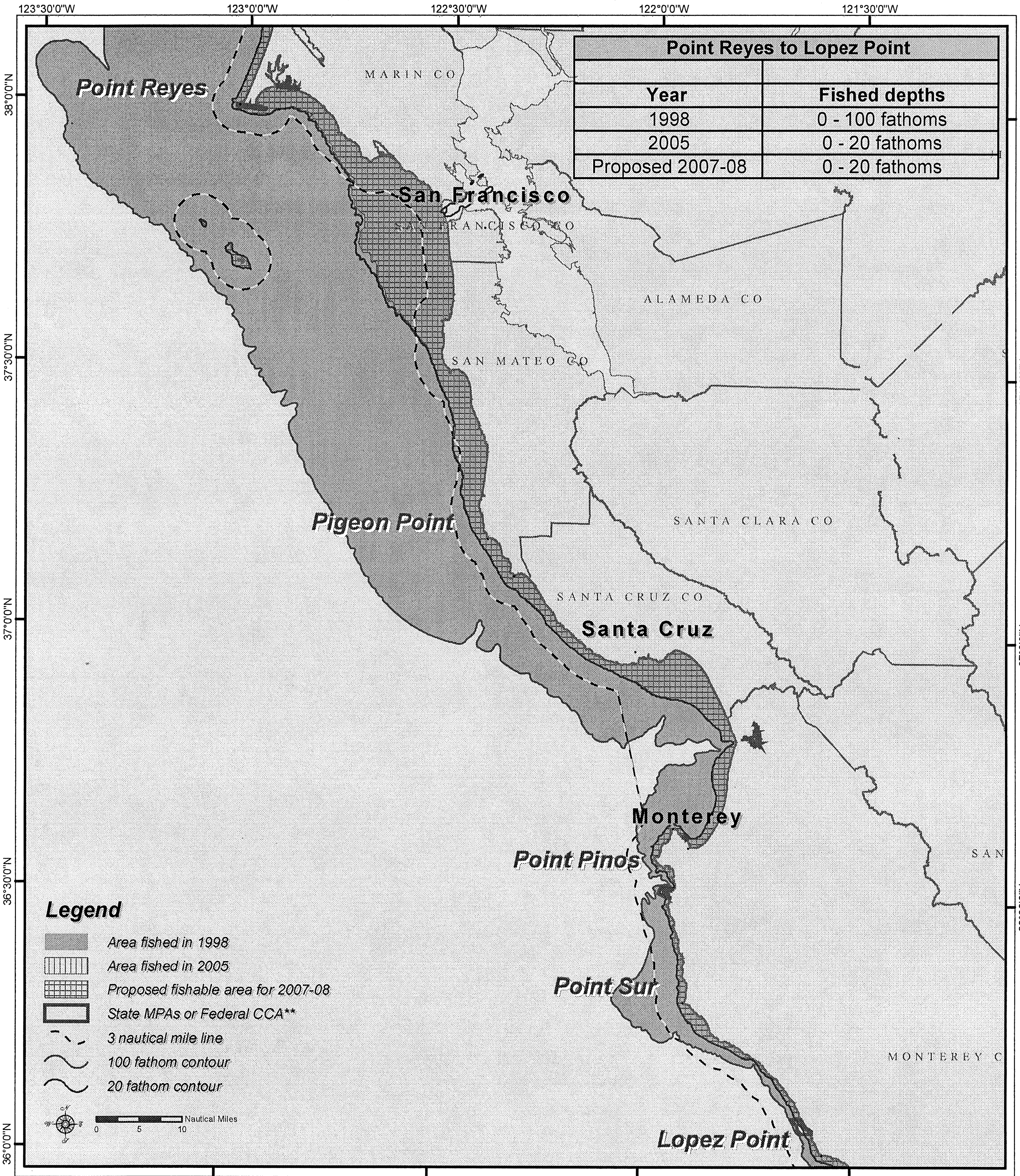
* Survey data suggest that in the past, fishing for rockfish, lingcod and associated species occurred in depths less than 100 fm north of Point Conception and less than 120 fm south of Point Conception.

** Marine Protected Areas (MPAs) or Cowcod Conservation Areas (CCAs) include areas less than 100 or 120 fathoms that were fished prior to their formal designations (such as in 1998 when the 100 and 120 fathoms depth zones represented fished areas).

Prepared By
California Department of Fish and Game
Marine Region GIS
May 10, 2006

Impacts of Regulations on Recreationally Fished Areas for Rockfish and Associated Species

Change in fishable areas shown for 1998, 2005, and proposed 2007 - 08 based on RCA Alternative 1 (Low)



Point Reyes to Lopez Point	
Year	Fished depths
1998	0 - 100 fathoms
2005	0 - 20 fathoms
Proposed 2007-08	0 - 20 fathoms

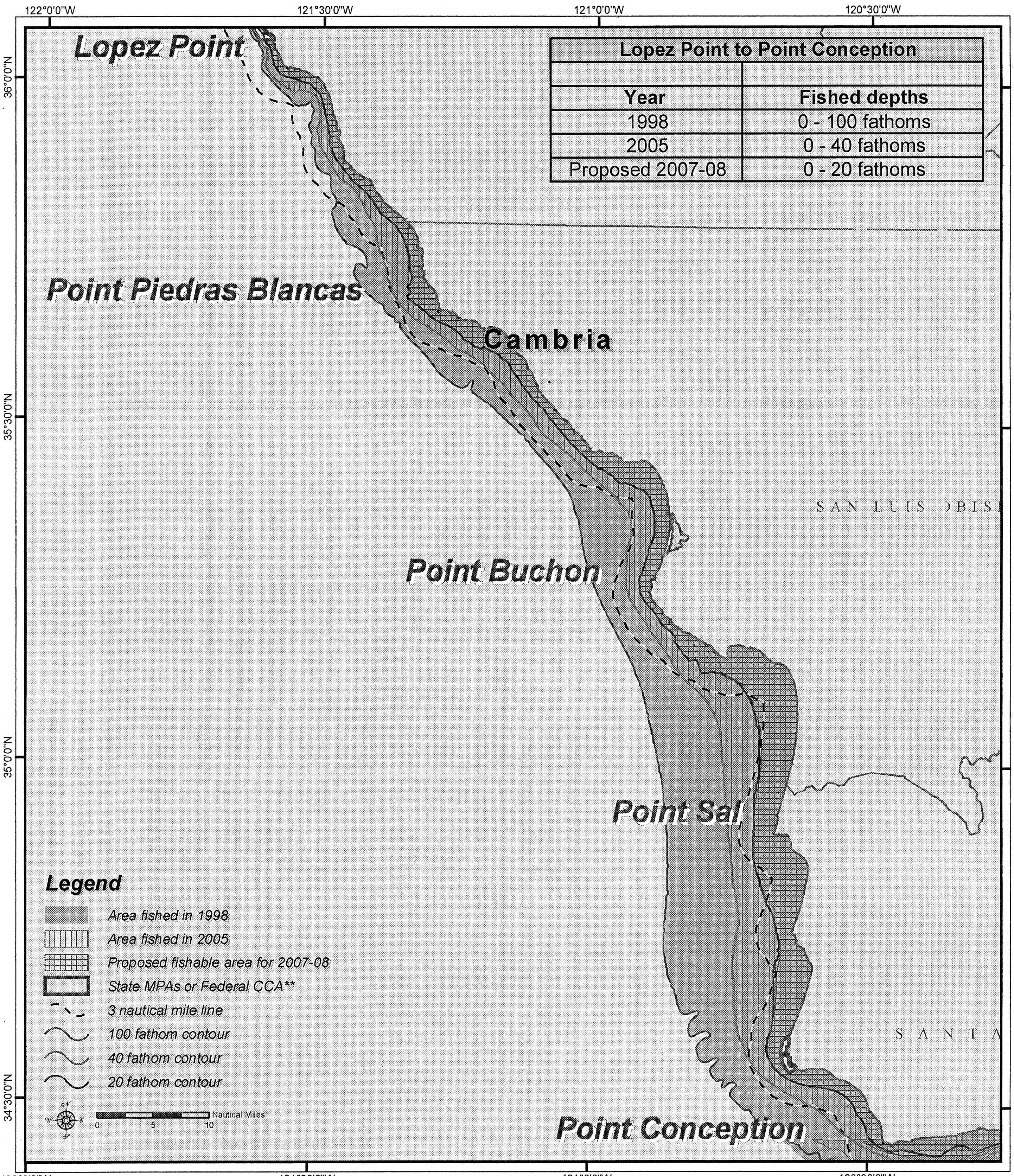
* Survey data suggest that in the past, fishing for rockfish, lingcod and associated species occurred in depths less than 100 fm north of Point Conception and less than 120 fm south of Point Conception.

** Marine Protected Areas (MPAs) or Cowcod Conservation Areas (CCAs) include areas less than 100 or 120 fathoms that were fished prior to their formal designations (such as in 1998 when the 100 and 120 fathoms depth zones represented fished areas).

Prepared By California Department of Fish and Game Marine Region GIS May 10, 2006

Impacts of Regulations on Recreationally Fished Areas for Rockfish and Associated Species

Change in fishable areas shown for 1998, 2005, and proposed 2007 - 08 based on RCA Alternative 1 (Low)



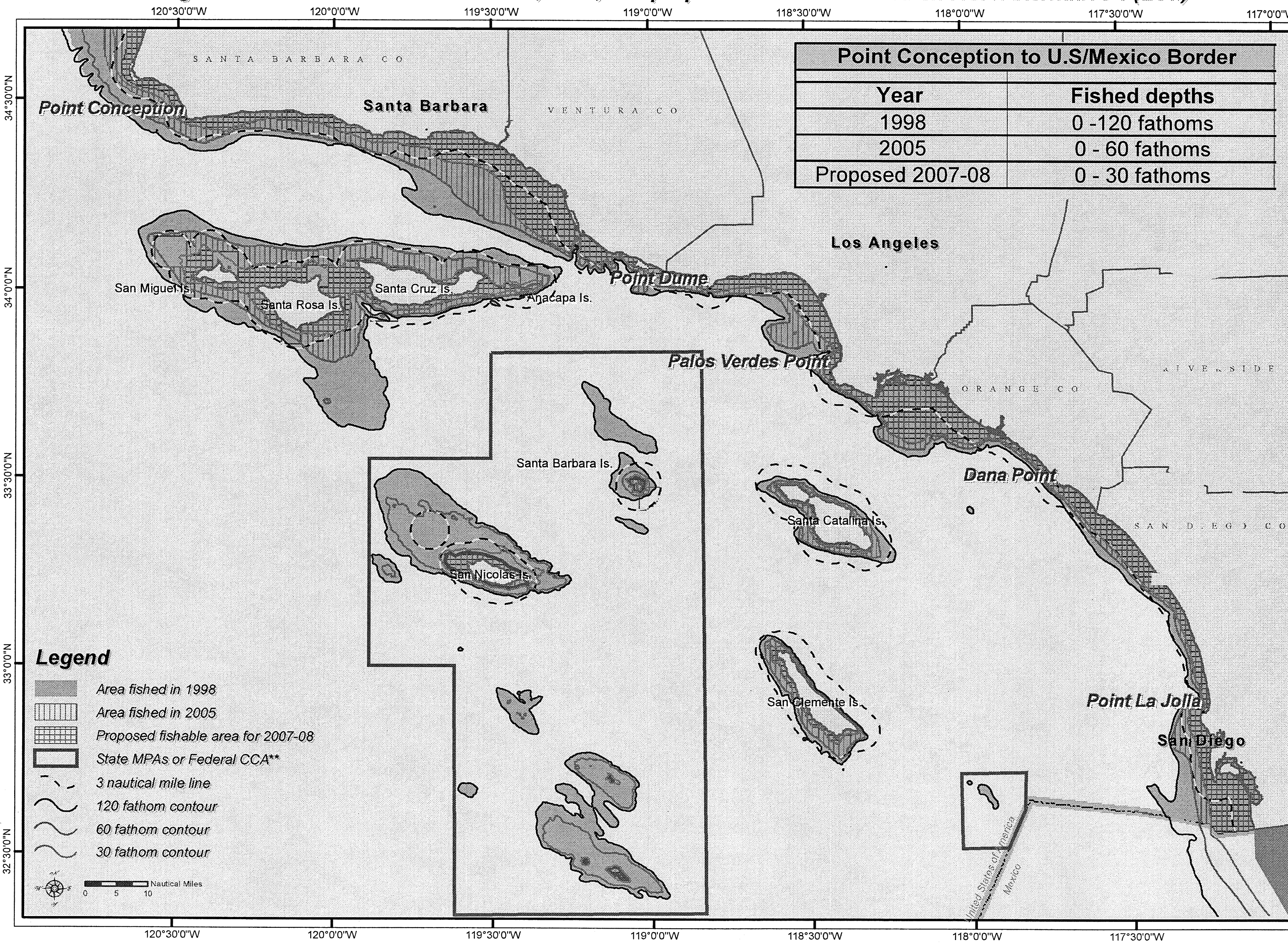
* Survey data suggest that in the past, fishing for rockfish, lingcod and associated species occurred in depths less than 100 fm north of Point Conception and less than 120 fm south of Point Conception.

** Marine Protected Areas (MPAs) or Cowcod Conservation Areas (CCAs) include areas less than 100 or 120 fathoms that were fished prior to their formal designations (such as in 1998 when the 100 and 120 fathoms depth zones represented fished areas).

Prepared By
California Department of Fish and Game
Marine Region GIS
May 10, 2006

Impacts of Regulations on Recreationally Fished Areas for Rockfish and Associated Species

Change in fishable areas shown for 1998, 2005, and proposed 2007 - 08 based on RCA Alternative 1 (Low)



Point Conception to U.S/Mexico Border	
Year	Fished depths
1998	0 -120 fathoms
2005	0 - 60 fathoms
Proposed 2007-08	0 - 30 fathoms

* Survey data suggest that in the past, fishing for rockfish, lingcod and associated species occurred in depths less than 100 fm north of Point Conception and less than 120 fm south of Point Conception.

** Marine Protected Areas (MPAs) or Cowcod Conservation Areas (CCAs) include areas less than 100 or 120 fathoms that were fished prior to their formal designations (such as in 1998 when the 100 and 120 fathoms depth zones represented fished areas).

Prepared By
California Department of Fish and Game
Marine Region GIS
May 10, 2006

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT ON THE TENTATIVE ADOPTION OF THE 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMAENDMENT 16-4

The Oregon Department of Fish and Wildlife (ODFW) met with members of the Sport Advisory Council (SAC) on June 6, 2006 to discuss the proposed management measures for the 2007-2008 Oregon recreational groundfish fisheries. SAC is an advisory body, providing management advice to ODFW, specific to the sport groundfish and halibut fisheries, and is comprised of representatives of the charter and private sectors of the sport fishery, as well as a representative of the port commissions. Membership is distributed coastwide in an effort to have representation of each of the coastal areas.

At this meeting, ODFW staff summarized the Council preferred harvest levels for species that constrain the Oregon sport groundfish fishery (primarily canary, yelloweye, and black rockfishes) and the range of management measures that are proposed for this fishery. The comments received from the series of public meetings that were held in May 2006 were also detailed, and the same questions posed to the public in those meetings were asked of SAC. A schematic of the management measure alternatives is provided for reference in figure 1. The following summary represents the consensus opinions of SAC:

1) Do you prefer a year round season in preference to a shorter season with less offshore closures and a larger marine bag limit?
    a) The majority of SAC members confirmed the desire for a year round season even if it meant reduced offshore opportunity. A minority preferred a shorter season. SAC confirmed they did not desire a marine bag limit of less than 5 fish.
2) Do you support a separate flatfish bag (excluding Pacific halibut) of 25 fish?
    a) SAC unanimously supported a separate 25 fish flatfish bag limit that excludes Pacific halibut.
3) What do you recommend for the lingcod daily bag limit and minimum length?
    a) The majority of SAC members supported a daily bag limit of 2 fish with a 22-inch minimum size requirement. It was thought a lingcod daily bag limit of 3 fish would increase time on the water and associated take of limiting species (i.e. canary, yelloweye and black rockfishes). A minimum size limit of 22-inches was projected to both increase the total harvest of lingcod and allow anglers to attain the lingcod daily bag limit quicker, reducing the time on the water and subsequent take of limiting species.
4) In the event that the low OY alternative for yelloweye rockfish is adopted by the Council, would (1) a longer groundfish season (6 months) with a reduced halibut quota (reduced by 30%) or (2) a shorter groundfish season (July through Labor Day) and no reduction to the halibut quota be preferable?
    a) SAC discussed the economic importance of the Pacific halibut fishery to the coast especially during the spring months. Pacific halibut opportunity provides income to pay expenses that have accrued during the winter months such as insurance, moorages, rent, and basic requirements of running a business. Additionally, the local ports depend on the Pacific halibut spring fishery for income from moorage and lodging fees. SAC recommended not reducing the halibut opportunity if at all possible. SAC also discussed the importance of the groundfish fishery during months without Pacific halibut or salmon opportunity. Loss of income generated by the groundfish fishery in the non-summer

months would effectively bankrupt many of the active charter vessels in Oregon. SAC was adamant that both alternatives 1a and 1b (figure 1) are very detrimental to the fishery and coastal economy.

5) The issue of expanding the Stonewall Bank closure area was reviewed with SAC. Staff is recommending that the closure area be increase in size. Not only halibut fishing will be closed in the area, but groundfish will also be closed. Some SAC members expressed concern over anglers with a legally caught halibut not being able to troll for salmon over the expanded (and present) closed area. A recommendation of allowing a halibut on the vessel while trolling in the area for salmon, but with an additional gear requirement requiring trolling with either a downrigger or diver was discussed. It was thought this would make illegal targeting of halibut difficult, help enforcement, and minimize the incidental take of yelloweye rockfish.

There have been several public comment letters regarding the 2007-2008 harvest specification and management measures that have been received by ODFW for distribution to the Council.

Those letters are attached.

Figure 1. Season structure along with expected yelloweye rockfish and canary rockfish impacts for various 2007-08 Oregon recreational fishery action alternatives, compared to the no action alternative.

Alternative	Season structure (Month: J F M A M J J A LDay S O N D)	Marine Bag	Ling Bag	Ling Size	Yelloweye Impact (mt)	Canary Impact (mt)
1a	J–J: CLOSED; J–LDay: GF open <20 fm; S–D: CLOSED	10*	3	20	1.6	1.6
1b	J–M: CLOSED; A–S: GF open <20 fm & Halibut fishery reduced by 30%; O–D: CLOSED	6*	3	20	1.5	2.3
2	J–D: GF open <20 fm	5*	2	22	1.9	2.6
3a	J–M: GF open <40 fm; J–LDay: GF open <25 fm; S–D: GF open <40 fm	5**	2	22	2.5	3.7
3b	J–D: GF open <40 fm	5**	2	22	2.9	4.0
No Action	J–M: GF open all depth; J–S: GF open <40 fm; O–D: GF open all depth	6*	2	24	3.6	5.3

* Status quo marine bag species.

**Marine bag limit excludes flatfish which have a separate 25 fish daily bag limit.

COMFORT INN AT GARIBALDI

Comfort INN

BY CHOICE HOTELS

6/8/06

As a manager of a hotel, in Garibaldi, I am very concerned that any change in the fishing structure would be devastating to our business, and community.

My hotel, as well as the community heavily depends on the recreational fishing industry to keep doors open, and our employee's working.

Please no action

Sincerely

Kevin M. Van

General Manager

502 Garibaldi Avenue
Garibaldi, OR 97118
Phone 503.322.3338
Fax 503.322.0328
For reservations worldwide: 800.4CHOICE choicehotels.com

GARIBALDI CHARTERS

PO Box 556, Garibaldi, OR 97118 **1-800-900-HOOK!**

Pacific Fisheries Management Council
Chairman David Hansen
Council Members

June 6, 2006

Dear Sirs,

We have reviewed the options for the Oregon recreational fishery presented to us by the ODFW. We would like you to understand what these options mean to our business. In 2005, 37% of our gross was earned from Jan to June and another 10% was earned in Sept and Oct. No small business, charter fishing or any of the other businesses connected to fishing can sustain the type of closure suggested in Option 1a. Since most of that 37% of gross is made from the May-June Halibut fishery, Option 1b is almost as bad. With all of the cutbacks we have had for the last three years, the spring Halibut fishery is all that has been keeping us alive.

Option 2 and Option 3a will put so much pressure on the rock fish that we will could be shut down as early as the first of July which will also put the charter fleet out of business. Even 3b is not a good choice as almost half of our trips from May to June were beyond forty fathoms for either Halibut or Ling Cod. We have only caught six yellow eye so far this year. The Captains are very good at staying away from any Yelloweye areas, and there are no Yelloweye at our 800' all-depth Halibut grounds.

We understand that the GMT came up with a step down program that might help reduce some of the adverse impacts of these drastic actions. Please consider using it. Present time assessments, done on the actual reef habitat where most yellow eye reside, rather than trawl fish data, needs to be done immediately. When the best available science uses old data, statistical theory and has no way to measure age or recruitment, there will never be a recovery! We believe you have come very close to the bottom line for most charter fishing businesses this year. The "No Action Option" is the only acceptable one left. Our family has been charter fishing for over 30 years. All of our children are in the fishing business-two are charter boat Captain's, one works for the ODFW and the youngest helps manage our charter office. Please do not let politics and questionable data ruin our family business, and our community's future!

Sincerely,

Mick & Linda Bull
OWNERS, Garibaldi Charters.

Independent Fish Filleter
Kelly Barnett
8365 Warren Street
Bay City, OR 97107
(503)377-0259
kellybarnett12@hotmail
"have knife…will travel"

Pacific Fishery Management Council
Donald Hansen, Chairman

Mr. Hansen and Fellow Councilors,

As an independent business owner and lifelong lover of the Oregon Coast and Pacific Ocean I applaud your commitment, work and dedication to the issues that affect the present and future of my home and livelihood.

In regards to current proposals for the 2007 and 2008 sports ground fishing regulations and management issues before the council I would like to offer the following opinions and observations.

First of all, most of the problems that I see and am experiencing are related to stock assessments and ABC's/OY's for canary, black and yelloweye rockfishes as well as a perceived ignorance of the social and economic impacts these assessments and council decisions based on these assessments have had on me and my community. These "best available science" studies are inherently flawed as there is no good science or studies as a starting point to draw conclusions from. We must work together to redefine what "best available science" means and how it is used in council decisions and deliberations, we must also work together on a simpler and cheaper approach to data collection that includes more anecdotal evidence and emphasizes acoustic studies over more expensive video technologies.

Ever decreasing bag limits and seasonal depth restrictions have crippled my ability to make a living in my chosen career, following in my father's footsteps as a fish filleter for both sports and commercial fishing enterprises. When I began my business the Oregon bag limit was 15 rockfish it is currently 6 marine fish, the effect this drastic and sudden lowering of sports as well as commercial catch limits has driven nearly all of the seafood workers and managers I know out of the fishing community or into a lowered standard of living. This is only the tip of the social and economic impacts that are occurring; I implore you to consider these hardships before you cut back and restrict my fishing community anymore.

In specific I am referring to the proposals for 2007-08 Oregon Recreational Fisheries proposal from ODFW, of which I have included a copy. Of the options listed the only one I feel that will not fatally wound my fishing community is the "No Action" alternative. We who have survived in the industry have tried our best to be creative and industrious to adapt to the recent "catastrophe" that has befallen us and continue on as a community. Any further restrictions to bag or depth limits would be disastrous to my business as well as my fishing community, I am afraid it cannot take another blow without dying. So please do not ignore the impacts decisions based on flawed conclusions will make to the social and economic dynamics of my fishing community.

Thank You for Your Dedication,

June 7, 2006

PFMC
Chairman- David Hanson
Council Members

To whom it may concern:

I am writing in response to your proposed season structure impacts for the 2007-08 recreational fishery action alternatives, compared to the no action alternative.

As the former owner of Garibaldi Charters and now a employee for the company I have a vested interest in the sport fishing industry in Garibaldi. The only acceptable alternative is the NO ACTION PLAN. Your 1a and 1b plans would by our records cause us to lose 50% of our business. Your plan 2, 3a and 3b are also unacceptable. If 1a and 1b were to be put into effect not only would the charter business be closed, but it would also effect the shops, gas stations, restaurants, grocery store, banks and every other business in Garibaldi. With the gas prices going up, the price of a day of fishing and lodging going up and our fishing seasons less and less our quota's being cut, how much longer do you think anyone can stay in the fishing industry and make a living. Well, let me tell you something, they can't and it's a shame. For the past 15 years we hung in there because we wanted to fish so people could have the experience but we can't much longer, and the sad part about it is that the ocean is full of fish.

Please weigh your options carefully and we can only hope your decision will be the right one as the Charter Companies really don't have too much to say about their future in this matter.

REMEMBER THE NO ACTION PLAN IS THE ONLY ACCEPTABLE ONE.

Thank You

Sharon Davis

Sharon Davis
Davis Fisheries

Classy Touch Imports & Gifts
236 Garibaldi Avenue P.O. Box 605
Garibaldi Oregon 97118

June 8,2006

Pacific Marine Council

Attention: Dave Hansen and Council Members

Dear Sirs:

It has been brought to my attention that there has been a proposal made to change the fishing guide lines for the year 2007-08, which will impact our fishing community greatly.

As a member of the Chamber of Commerce and a Business owner in Garibaldi, I feel we all depend on the fishing season heavily to support our town. They buy their gas here, stay in our motels, eat at our restaurants and shop at our local retail shops.

I feel adopting measure 1A or 1B would surely put the Charter Boats out of business. Which means I would have to eventually close my doors too.

I would hope you would accept my vote to take no new action.

Sincerely,

Gerry Bales

Gerry Bales
Classy Touch Gifts and Art Gallery

Pacific Fisheries Management Council
Chairman Davis Hanson
Council Members

Dears Sirs,

I have been in the fishing industry since 1968 and owned KERRI LIN CHARTERS since 1975. There have been many changes in regulations, limits and prices during this time. We try to help the local economy by having customers use local motels, food services, and gift shops. We are trying to survive.

The 2007-08 ODFW options was shown to me yesterday. There is only one option to help us stay in business: NO ACTION.

I concentrate on the fish inside 40 fathoms from May to early Sept. Other charters go "out deep" for the halibut and Cod. We should be allowed to do that for a longer period of time. When we are forced inside, the quota goes quickly.

Let us fish. Don't confuse the public with constant changes. Help Garibaldi businesses.

Thank you,
Jon F. Brown
06/08/06

Bayshore
INN

Jim & Alberta Stamm, Managers

P.O. Box 584
227 Garibaldi Avenue
Garibaldi, Oregon 97118

(503) [illegible]
Fax (503) [illegible]
[illegible]
[illegible]

6-8-2006
PFMC
Chairman & Council Members,

Dear Sirs,

We have been informed that you are considering greatly reducing the number of fishing days for the 2007-2008 fishing season. My husband and I have managed the Bayshore Inn in Garibaldi for many years. In the spring, the bulk of our customers come from recommendations of the local charter offices. Many private boat owners stay with us, too. Any reduction in fishing could be devastating to our business.

We understand that some of the options you are considering could actually put charter offices completely out of business. This would seriously affect our whole community as the fishing and related businesses, and the lumber mill are our only employers. Instead of being one of Oregon's true fishing villages, we could become one of Oregon's newer ghost towns. Please consider the economic restrictions these type of regulations would have for all of Oregon's coastal towns. Our fishermen are always amazed by the abundance of fish around here, so it is hard to understand why you would have to shut down a whole industry because you think one species may be endangered.

Sincerely,

James A. Stamm
Alberta R Stamm

Loyce B. Bass
P.O. Box 408
Garibaldi, OR 97118

Dave Hansen and Council Members
Pacific Marine Fisheries Council

June 8th, 2006

Dear Mr. Hansen and Council Members:

It is with dismay I have learned of possible additional limitations of the charter fishing season in my beloved Garibaldi and other Pacific Coastal areas.

Please consider my concerns in your decision:

- The negative effect on the livelihood of charter businesses in our already economically struggling area
- The negative effect on the spin off business locally, i.e.: motels, restaurants, retail businesses
- Limitations on the opportunity for visiting and local fishermen's family members to experience the lively port area, including educational opportunities of the importance of the bay and estuary
- The negative effect to the Port of Garibaldi, as fewer charter businesses survive to utilize the charter slips

My family and I have been coming to this area since 1982, enjoying the fishing village atmosphere enhanced by the charter boats and the tourist business they attract.

It is my request that no changes be made in the current season and allowable catch.

Please allow the charter industry to survive, as it barely doing at this time. Garibaldi and other coastal communities need the life infused by the fishing industry.

Thank you for your kind consideration of my input into your decision.

Very truly yours,

Loyce B. Bass

Loyce B. Bass

June 8, 2006

Atten: Pacific Fishery Management Council
Don Hansen, Chair and Council Members
Reg: 2007-2008 Ground Fish Regulations

After attending the public meetings held by ODF&W and learning about what the PFMC is considering I felt it necessary to advise you of our situation.

We are a family business operating two six pack charter boats fishing out of Gold Beach and Port Orford. Due to the past and certainly current salmon regulations over 90% of our business is halibut and bottom fish.

We operate year round and depend on this as our livelihood for my wife and myself and our two sons as well as one employee. Any further restrictions i.e. shortened seasons, reduced bag limits or depth restrictions above what we deal with now would severely impact our business in a negative way to the point of putting us out of business.

We understand the conservation issues and practice release techniques developed by the ODF&W using release baskets and fishing shallower water whenever possible.

Our customers, due to the population base, travel a minimum of three hours to fish with us and as a result spend time coming and going in the community which also adds to the economic value of them fishing with us. We are the only charter business out of these two ports that work on a full time basis and this oportunity for cusomters to fish and ourselves make a living in a tourism based economy would be lost in the event further restrictions were put in place.

We ask the PFMC carefully reviews this when they set the regulations as we are not the only ones that will be put out of business as there are others exactly like us up and down the coast.

I thank you for your time and consideration.

Sincerely,

Mark Lottis

Mark Lottis, Partner
Five Star Charters
Gold Beach

June 7, 2006

Atten: Pacific Fishery Management Council
Don Hansen, Chair and Council Members
Reg: 2007-2008 Ground Fish Regulations

This letter is to convey our Association's position on further restrictions on ground fish i.e. season limits and/or bag limits.

We represent over fifty individuals and local businesses that depend heavily on the recreation and economic value that this brings to the Gold Beach area.

Our fishing grounds are already highly restricted naturally as of result of weather conditions that prevent over fishing. We need a full year round season just to get in a reasonable amount of fishing days. If any further restrictions are put on rock fish and lingcod we will for all practical purposes not have any opportunities at all for this fishery.

Please take this into consideration when making the 2007-2008 regulations.

Sincerely,

Don Foss

Don Foss, Secretary
Curry Sportfishing Association

Port of Newport

600 S. E. BAY BOULEVARD NEWPORT, OREGON 97365 (541) 265-7758 FAX (541) 265-4235

Memo

To: Pacific Fisheries Management Council (PFMC)

From: Don Mann, General Manager

Copy: ODFW Commission
Port of Newport Commission

Date: June 12, 2006

Re: Proposed Management Measures for the 2007-08 Oregon Recreational Groundfish Fishery

---

Please consider the following comments and information prior to any final decisions that will affect or change the present groundfish fishery off the Oregon Coast.

It is our recommendation that the no action alternative be taken based on the following:

- In consideration of *Action Alternative 1a*, it should be noted that 48% of all 2005 angler trips out of Newport were for groundfish. This proposed alternative would represent a 20% loss of all angler trips. This represents approximately 20% loss of launch revenue, recreational moorage fees – both long and short term, charter lease fees, as well as visitors to our RV Park. These numbers equate to a 15% loss of revenue to our total annual budget, nearly $344,000 ... just one port on the Oregon Coast.

- Action *Alternative 1b* could have an even larger affect due to the fact that the Department is proposing to reduce the recreational halibut catch and further reduce time on the water. It has taken nearly 10 years to rebuild and bring back the halibut stocks to the point that Oregon recreational fishers rely and look forward to the halibut openers as a relief to the salmon restrictions that keep mounting.

- It is difficult, with such little time to prepare, to place an exact dollar amount on the economic impact that the proposed management measures could have locally, especially given the fact that we are right in the middle of one of the worst salmon disasters to hit the coast since the listing of the coho.

I don't have the answers or another alternative that would further reduce the impacts on the yelloweye rockfish and canary rockfish, but I do know that any further restrictions to bottom fish bag limits or reduced fish days is not a good idea.

The Port of Newport recommends status quo.

L:\CORRESP\odfw groundfish mgmt.doc

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT ON THE TENTATIVE ADOPTION OF 2207-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

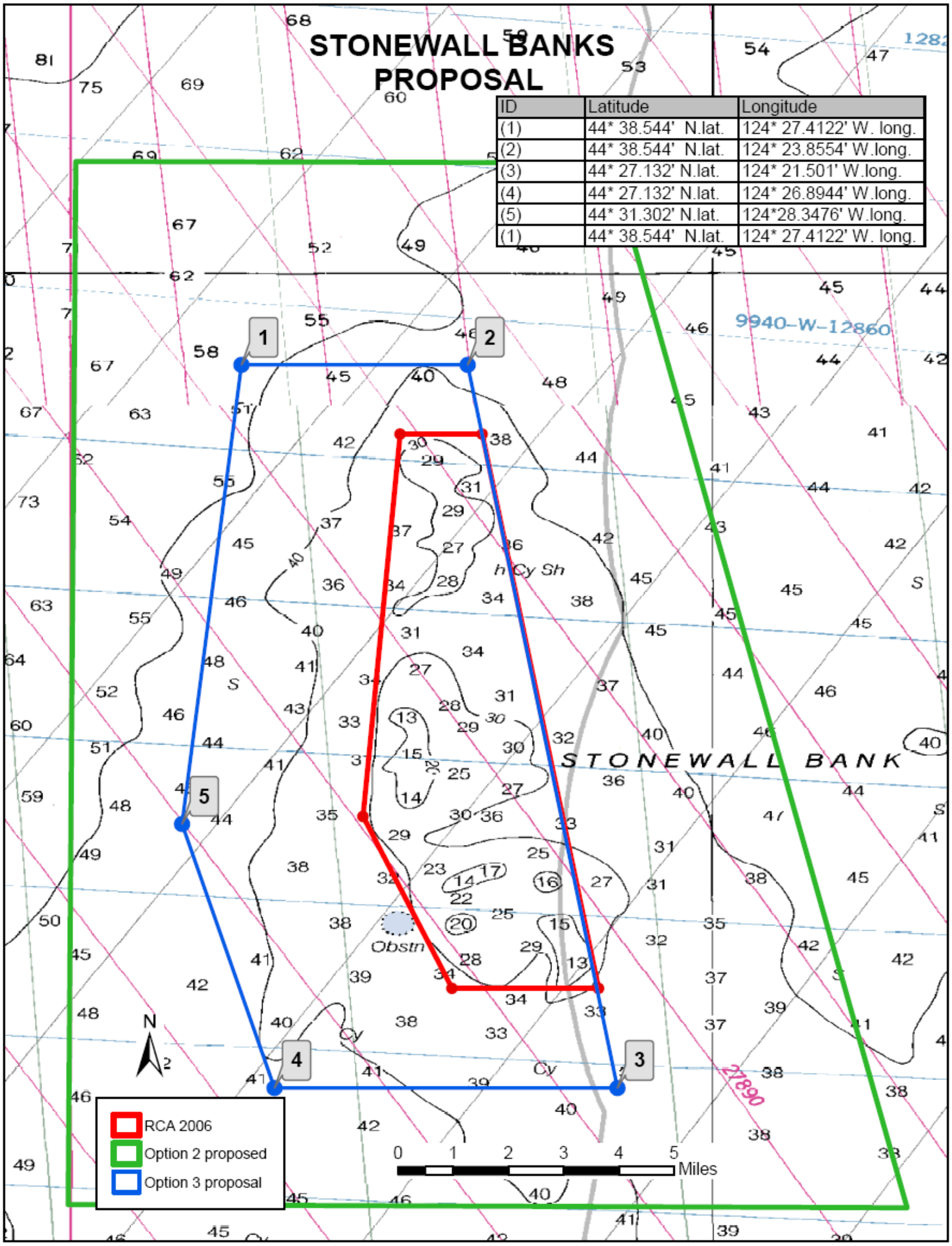
The Oregon Department of Fish and Wildlife (ODFW) worked with fishery participants to determine an appropriate northern line for the proposed Stonewall Bank closure option 3 (ODFW Report 2) for the implementation of a recreational Yelloweye Rockfish Conservation Area (YRCA) located at Stonewall Bank, off the coast of Newport, Oregon. This third option (figure 1) is within the range of options for development of a recreational Stonewall Bank YRCA, previously adopted by the PFMC at its April 2006 meeting.

The coordinates contained in this report replace those contained in ODFW Report 2. Minor adjustments were made to the northern line to provide consistency in the east lines between options 1 (current closure in the Pacific halibut fishery) and 3, as there are no current necessities to adjust the eastern boundary. The northern line was not adjusted further north, as the occurrence of yelloweye rockfish in the area to the north was not consistent, and the habitat is mostly sand or hard bottom, with patchy rock outcroppings.

Stonewall Bank YRCA modified option 3 coordinates:

	Latitude		Longitude	
ID	**Degrees**	**Decimal Minutes**	**Degrees**	**Decimal Minutes**
1	44	38.544	124	27.4122
2	44	38.544	124	23.8554
3	44	27.132	124	21.501
4	44	27.132	124	26.8944
5	44	31.302	124	28.3476
1	44	38.544	124	27.4122

Figure 1. Each of the three options for the implementation of a recreational Stonewall Bank YRCA. Option 1 is the smallest box and represents the current closure in the Pacific halibut fishery. Option 2 is the largest box and represents an analysis area adopted at the April Council meeting, and Option 3 (modified from that detailed in ODFW Report 2) is the box in between, and represents ODFW's preferred alternative.



Agenda Item F.2.b
Supplemental ODFW Report 5
June, 2006

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT SUPPORTING ADOPTION OF THE "RAMP-DOWN" YELLOWEYE ROCKFISH OPTIMUM YEILD

The Oregon Department of Fish and Wildlife (ODFW) supports adoption of the "ramp-down" yelloweye rockfish optimum yield (OY). ODFW believes this strategy, while extending the rebuilding time for this stock by ~6 months (estimated to rebuild in the year 2083.5) as compared to the Low OY Alternative (estimated to rebuild in the year 2083), will provide the time required for businesses dependant on recreational and commercial groundfish fisheries (both directly and indirectly) to make appropriate adjustments to business plans, and for fishery managers to collect data needed to develop additional management tools to structure meaningful fisheries under the low OY anticipated in 2011 (13.5 metric tons).

Community Vulnerabilities

The Oregon counties among the 15 counties coastwide that were labeled as "vulnerable" areas (high engagement or dependence on commercial or recreational fisheries and low resilience to change) include Clatsop, Coos, Curry, Lincoln, and Tillamook counties (as noted in Chapter 7 of the preliminary draft EIS, section 7.1.5.2.3, p. 31). Of the 6 counties labeled "most vulnerable", 2 are located in Oregon (Coos and Lincoln counties). All of the above counties were identified as "vulnerable" in both the commercial and recreational fishery analysis.

Recreational Fishery

Oregon's marine recreational fisheries are comprised of anglers targeting primarily groundfish, Pacific halibut, salmon, tuna, or a combination thereof. Yelloweye rockfish, deemed most limiting of the depleted species to the recreational fisheries, are impacted in nearly all target strategies, most concentrated in the groundfish and Pacific halibut fisheries. The groundfish and Pacific halibut fisheries have been increasingly restricted for the purposes of reducing impacts to canary and yelloweye rockfishes. Management tools such as time and depth restrictions, non-retention, and area closures have been implemented in both of the key fisheries to conserve depleted species. Additional measures, such as the proposed Stonewall Bank Yelloweye Rockfish Conservation Area, are being considered for implementation in 2007-2008 to further conserve canary and yelloweye rockfishes.

Under the 12 metric ton yelloweye alternative, the Oregon recreational fishing effort for groundfish and Pacific halibut would decrease by 32% (Chapter 7, section 7.2.10.1.2, p. 50), resulting in an estimated impact to income of $2.62 million or 34% (Table 7-68d., p. 151). In addition, fishing seasons would be severely shortened which would have additional implications. Fewer tourists would be drawn to communities during times when fishing closures are in place. Support industries such as charter offices, fuel stations, sporting goods stores, marinas, motels, campgrounds, restaurants, grocery stores, and many other local businesses will lose income, and in some cases, close their business. The economic impacts will be far reaching and much larger than indicated by just examining changes in angler trips.

Under Action Alternative 1, structured to address the Low OY Alternative for yelloweye rockfish of 12.6 metric tons, all Oregon regions are estimated to experience decreases in estimated income generated from recreational groundfish charter boat fisheries that are greater than 39% (Chapter 7, section 7.2.11, p. 53). With regards to income generated by recreational groundfish private trips, all Oregon regions are estimated to experience decreases that are greater than 37%. These reductions are attributed to limited fishery opportunity (fishery open for 2-6 months) and depth restrictions (fishery restricted to waters shoreward of 20-fathoms during the open period). Income loss at these levels will effectively close the recreational groundfish charter boat fishery in Oregon, as the charter industry will not be able to sustain basic operational costs (Supplemental ODFW Report 3, Agenda Item F.2.b, June 2006). Additionally, projected decreases in income would cause undue hardship on Oregon's coastal communities that are already depressed (5 of 7 coastal counties deemed "vulnerable").

To conduct meaningful recreational fisheries with very low impacts of canary and yelloweye rockfishes, ODFW is gathering information related to site fidelity, survivability, effective release methods, and recreational gear selectivity. A variety of research projects are currently being conducted, and are planned to either continue in 2007 and/or be expanded in the future. Results have been summarized for use in public education brochures, scientific journals, and potential inclusion in stock assessments. It is very likely that it will not be feasible to continue this research under the Low OY Alternative for yelloweye rockfish.

Commercial Nearshore Fisheries

Reduced allowable harvest of yelloweye rockfish will also impact various commercial fisheries, including the Oregon commercial nearshore fishery. With regards to the commercial nearshore fishery for the area north of 40° 10' N. Lat., Action Alternative 1, structured to meet allowed impacts under the Low OY Alternative for yelloweye rockfish, would require a 60% reduction of black rockfish harvest. Black rockfish comprise the majority of the catch in this fishery. The fishery is currently operating on very low monthly trip limits (300-600 pounds/month of black and blue rockfish combined). Fishery participants have asserted that the current limits represent the minimum amount of monthly harvest required to be able to maintain business operating costs and viability. Analysis shows that under Action Alternative 1, ex-vessel revenue for the commercial nearshore fishery in the area north of 40° 10' N. Lat. would be reduced by 42% as compared to 2005 revenue (Table 7-54, Chapter 7, p. 124). This estimate is considered to be conservative, as it does not factor in loss to fishery support businesses (i.e. ice plants, fabrication shops, gear manufacturers/suppliers, etc.) and the greater communities. Projected decreases in income would cause undue hardship on Oregon's coastal communities that are already depressed (5 of 7 coastal counties deemed "vulnerable").

Agenda Item F.2.b
Supplemental Tribal Comment
Quileute Indian Tribe
June 2006

Testimony of the Quileute Tribe on Groundfish Management to the PFMC

The Quileute Tribe is very concerned about the future of all west coast groundfish stocks and in particular, the current status of Yelloweye rockfish. For many years, the Tribe has taken substantial measures to insure a minimal impact on this species of concern. We have implemented a full retention fishery with 100 lb/trip/vessel landing limits to ensure that our individual fisherman are having a minimal impact on the stock and to further ensure that we, as co-managers, have a full accounting of total Yelloweye mortality. The Tribe has achieved additional catch reductions actively avoiding Yelloweye "hot spots" and through the reduction of the inter-tribal open-competitive halibut fishery. These management strategies have allowed the Quileute Tribe to keep its total Yelloweye bycatch to less than 1 metric ton per year over the past 5 years and less than 600 pounds in 2005.

Considering the significant difference in catch favoring the non treaty fleet and the pre-conservation measures that the Quileute Tribe has already taken to protect this species the Tribe believes that it would be both a violation of its Treaty with the United States and economically devastating for the Tribe to bear the brunt of any additional conservation measures. In addition, NMFS, as an agent of the Federal government, has a fiduciary duty and primary trust responsibility to protect and preserve the Tribe's treaty-secured fishing rights. The federal government and NMFS would violate both its fiduciary responsibility to the Tribe and the Treaty itself if it were to require the Tribe to further reduce its fisheries below current levels, without, at the very least, first looking to non-Quileute fisheries to bear the burden of additional conservation steps.

Additional conservation measures would have severe economic impacts on the entire Quileute Tribal fishing fleet and the broader Tribal community. The Quileute Indian Reservation is located in La Push, Washington, which is about 15 miles West of Forks on the Washington Coast. It is a rural reservation in an area with very few economic opportunities for tribal members. Other than work in tribal government, fisheries represent the only other significant source of jobs for tribal members on the reservation. There are usually between 5 to 7 tribal boats that participate in the tribal ocean fisheries, which provide jobs for not only the vessel owners but crew members as well. In addition, the Tribe owns a fish processing plant that is dependent in large part on the catch that is brought in by tribal fisherman. This fish processing plant is also an important source of employment for tribal members, as well as an important source of revenue for the Tribe itself. The diminishment or loss of fishing related jobs would have a very significant and potentially devastating impact on the Tribe's economy.

Tribal Proposal Regarding Groundfish Fisheries for 2007 and 2008

Black Rockfish - The 2007 and 2008 tribal harvest guidelines will be set at 20,000 pounds for the management area between the US/Canada border and Cape Alava, and 10,000 pounds for the management area located between Destruction Island and Leadbetter Point. No tribal harvest restrictions are proposed for the management area between Cape Alava and Destruction Island.

Sablefish - The 2007 and 2008 tribal set asides for sablefish will be set at 10 percent of the Monterey through Vancouver area OY minus 1.9 percent to account for estimated discard mortality. Allocations among tribes and among gear types, if any, will be determined by the tribes.

Pacific cod - The tribes will be subject to a 400 mt harvest guideline for 2007 and 2008.

For all other tribal groundfish fisheries the following trip limits will apply:

Thornyheads - Tribal fisheries will be restricted to the Limited Entry trip limits in place at the beginning of the year for both shortspine and longspine thornyheads.

Canary Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit.

Other Minor Nearshore, Shelf and Slope Rockfish - Tribal fisheries will be restricted to a 300 pound per trip limit for each species group, or the Limited Entry trip limits if they are less restrictive than the 300 pound per trip limit.

Yelloweye Rockfish - The tribes will continue developing depth, area, and time restrictions in their directed Pacific halibut fishery to minimize impacts on yelloweye rockfish. Tribal fisheries will be restricted to 100 pounds per trip.

Spiny Dogfish - The Makah Tribe is proposing a directed longline fishery for spiny dogfish for 2007 and 2008. The fishery would be restricted to the Limited Entry trip limits. Increased landings of dogfish by treaty fishermen in 2007 and 2008 would be dependent on successful targeting in 2006 while staying within current estimates of impacts on overfished species.

Full Retention - The tribes will require full retention of all overfished rockfish species as well as all other marketable rockfishes during treaty fisheries.

Tribal Proposals Regarding
Makah Trawl fisheries for 2007 and 2008

Midwater Trawl Fishery - Treaty midwater trawl fishermen will be restricted to a cumulative limit of yellowtail rockfish, based on the number of vessels participating, not to exceed 180,000 pounds per two month period for the entire fleet. Their landings of widow rockfish must not exceed 10 percent of the poundage of yellowtail rockfish landed in any given period. The tribe may adjust the cumulative limit for any two-month period to minimize the incidental catch of canary and widow rockfish, provided the average cumulative limit does not exceed 180,000 pounds for the fleet.

Bottom Trawl Fishery - Treaty fishermen using bottom trawl gear will be subject to the trip limits applicable to the limited entry fishery for Dover sole, English sole, rex sole, arrowtooth flounder, and other flatfish. For Dover sole and arrowtooth flounder, the limited entry trip limits in place at the beginning of the season will be combined across periods and the fleet to create a cumulative harvest target. The limits available to individual fishermen will then be adjusted inseason to stay within the overall harvest target as well as estimated impacts to overfished species. For petrale sole, fishermen would be restricted to 50,000 pounds per two month period for the entire year. Because of the relatively modest expected harvest, all other trip limits for the tribal fishery will be those in place at the beginning of the season in the limited entry fishery and will not be adjusted downward, nor will time restrictions or closures be imposed, unless in-season catch statistics demonstrate that the tribe has taken ½ of the harvest in the tribal area. Fishermen will be restricted to small footrope ($\leq$ 8 inches) trawl gear. Exploration of the use of selective flatfish trawl gear will be conducted in 2006.

Observer Program - The Makah Tribe has an observer program in place to monitor and enforce the limits proposed above.

WASHINGTON DEPARTMENT FISH AND WILDLIFE JUSTIFICATION FOR APPLYING THE RAMP-DOWN OY APPROACH TO REBUILDING YELLOWEYE ROCKFISH

As noted in the Draft Environmental Impact Statement (EIS) and the Groundfish Management Team report on Agenda Item F.2, the yelloweye is data poor and highly uncertain. All of the yelloweye assessments have been tuned to a recreational catch-per-unit-of-effort (CPUE) index and lack fishery independent trend information. Standardized fishery independent sampling is designed so that changes in sampled indices reflect changes in the population being measured rather than the method of sampling. Fishery CPUE can be prone to those changes being partially reflective of changes in behavior of the fishery (area, gear, target strategies, etc.) rather than changes in the population. As noted by the Center for Independent Experts reviewer of a previous yelloweye assessment, "CPUE data are of fundamental importance in this assessment because this is the only data type which provides direct evidence of biomass trends. However, there is always doubt as to whether any fishery-derived CPUE series is proportional to abundance." The current assessment authors state, "As in the previous assessments, the sparseness of the size and age composition data and the lack of a relevant fishery-independent survey has limited the model's ability to properly assess the status of the resource."

The baseline model assumed a single coast-wide stock and complete mixing. Given the apparently sedentary nature of this species this may be unrealistic. However, even though the approach may be desirable, current data are too sparse to support area-specific models. This is especially problematic in trying to construct the historical population required to model the population off Washington within the Stock Synthesis 2 software employed in the assessment. Although data are too sparse for a specific model off the Washington coast, previous assessment authors have commented on data that may point to a less depleted yelloweye resource in this area (trawl survey abundance, lower historical exploitation, larger average size). "The WA result is for a much lesser degree of stock decline." (Methot, et al. 2002 Yelloweye Assessment). However, until further data are collected, we will be unable to address this uncertainty. As stated in the assessment, "…due to catch restrictions since 2002, catch-per-unit-effort (CPUE) data no longer reflect the real changes in population abundance, and discard estimates are highly uncertain."

Uncertainty in the data and assessment versus the certainty of the major impacts upon industry need to be a consideration in how we proceed with respect to yelloweye rockfish.

One source of information for stocks off Washington might be to collaborate with Department of Fish and Oceans, Canada to draw upon information on the yelloweye stock and management response immediately to the north in British Columbia. Yelloweye catch quotas for the British Columbia fishery for the current year are 83 mt for the commercial fishery off the west coast of Vancouver Island, and 284 mt coastwide. Recreational catches would be in addition. To provide some perspective, this means, that after rebuilding our yelloweye stock over a 70 to 80 year period, the MSY catch level for the entire US coast will still be less than half the total of the current annual commercial catch off the west coast of Vancouver island (less than the length of the Oregon coast).

Efforts to Collect Additional Data

The Washington Department of Fish and Wildlife (WDFW) is working on several initiatives to collect additional biological data and fishery information, including:

- In 2006, WDFW is partnering with the International Pacific Halibut Commission to enhance their longline halibut survey by setting additional stations in "untrawlable" areas off Washington's north coast. WDFW hopes to continue this effort in 2007 and would also like to expand the enhanced survey with additional stations off Oregon.

- WDFW is working with scientists from Alaska and British Columbia to assemble and review data on yelloweye growth and natural mortality; these data could potentially be used to address the assumption for natural mortality (M) in the next stock assessment.

- Collection of biological and species distribution information from federal and state at-sea observer programs.

- In May, WDFW began a voluntary recreational private angler camera project to collect species identification and length data from recreational fishers.

- In May, WDFW began a voluntary logbook program for charter and private recreational boats; these data could help identify the fishing locations of these fisheries and bycatch information on canary and yelloweye rockfish.

- Also in May, WDFW began a voluntary logbook program for limited entry fixed gear participants to collect much-needed fishery location data.

In addition to these efforts, WDFW is continuing to develop a yelloweye occurrence and habitat GIS database, implement a strong public education program, and work with stakeholders from commercial and recreational fishers to refine yelloweye rockfish conservation areas (YRCAs).

Impacts to Washington Recreational Fisheries

Under the $T_{F=0}$ yelloweye OY, the estimated loss to recreational fisheries is about 1,150,000 angler trips (as noted in Chapter 7 of the draft EIS, section 7.2.10.1.1, p. 49). Washington recreational bottomfish and halibut angler trips are estimated to decline by 30% under the yelloweye OY of 12 mt (Chapter 7, section 7.2.10.1.1, p. 50). These projected reductions in angler trips would cause undue hardship on Washington's coastal communities that are already depressed.

For reference, the status of Washington's coastal communities was described in the 2000 U.S. census. In 2000, the population of Neah Bay was 794, which is a 13.3% decline from 1990. There is a 24% unemployment rate in Neah Bay. The per capita income was $11,338 with a median household income of $21,635; these data indicate that 29.9% of the Neah Bay population is below the poverty level. A lot of the employment in Neah Bay is seasonal in nature, with fisheries employing about 300 people per year.

Also according to the 2000 U.S. census, the population of La Push was 371. There is an unemployment rate of 27.4% in La Push. The per capita income was $9,589 with a median household income of $21,750, which indicates that 34.5% of the population is below the poverty level. In 2000, the population of Westport was 2,137. There was a per capita income of

$17,362, and a median household income of $32,037, which indicates that 14.3% of the population is below the poverty level.

In 2006, Washington's recreational fisheries were further constrained by the implementation of depth restrictions off our North Coast and central areas, where yelloweye are caught. These include a 20-fm depth restriction applied to the fisheries operating out of Neah Bay and La Push from late May through the end of September, and a 30-fm depth restriction from mid-March through mid-June to the recreational fishery out of Westport. Given the location of the continental shelf off Neah Bay, the 20-fm depth restriction is about 0.5 to one mile offshore. These depth restrictions, especially in the North Coast area, have severely impacted recreational bottomfish fisheries targeting healthy lingcod and black rockfish stocks, and have resulted in additional economic loss to the coastal communities.

With regard to Action Alternatives 1 and 2, the results of these alternatives would virtually eliminate the Washington North Coast recreational halibut fishery in Neah Bay and La Push. There are 38,985 angler trips taken out of Neah Bay annually, 26% of which (10,166) are halibut trips. There are an additional 7,984 angler trips originating out of La Push, 17% of which (1,389) are halibut trips. Both Neah Bay and La Push are considered to be vulnerable recreational fishing communities and they both have very low resiliency (as noted in Chapter 7 of the draft EIS, section 7.1.5.2.2 on p. 30). Action Alternative 1 would result in a decrease of 33% in recreational charter trips, and a decrease of 27% of private boat trips in the North Coast, and Alternative 2 would reduce charter trips by 42%, and private boat trips by 32% (Chapter 7, section 7.2.11, p. 53). These reductions are the result of fishery closures and increased depth restrictions, but do not include any projected reductions resulting from the proposed area closures for yelloweye conservation; therefore, the estimated reductions are likely low.

Impacts to Washington Commercial Fisheries

Under the TF=0 yelloweye OY, the estimated loss to commercial fisheries is over $100 million in ex-vessel revenues, which would result from complete closures of the tribal groundfish fisheries and closures of Washington longline and pot fisheries (as noted in Chapter 7 of the draft EIS, section 7.2.10.1.1, p. 49). Commercial ex-vessel revenues could decline by as much as 40% under the yelloweye OY of 12 mt (Chapter 7, section 7.2.10.1.1, p. 50). To ensure this low OY was not exceeded, the non-trawl rockfish conservation area would have to expand from the shoreline to 150 fms offshore, precluding access to prime sablefish and dogfish areas that are the backbone of Washington's longline fishery. The economic impacts resulting from these measures, again, would cause undue hardship on Washington's coastal communities that are already depressed. Areas labeled "most vulnerable" with regard to commercial fishing in Washington include Neah Bay and Ilwaco; other commercial vulnerable areas with low resiliency include La Push, Westport and Bellingham.

For the reasons described above, the Washington Department of Fish and Wildlife believes the ramp-down strategy is justified for setting the OY for yelloweye rockfish.

Agenda Item F.2.b
WDFW Report
June 2006

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE REPORT ON 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

The Washington Department of Fish and Wildlife (WDFW) held public meetings following the April Council meeting to review and discuss proposed closed areas for protection of overfished rockfish, primarily yelloweye. Anecdotal information communicated to WDFW staff indicated that some of the proposed areas, including portions of the current "C-shaped" closed area, have not produced yelloweye rockfish, whereas other areas consistently contain yelloweye.

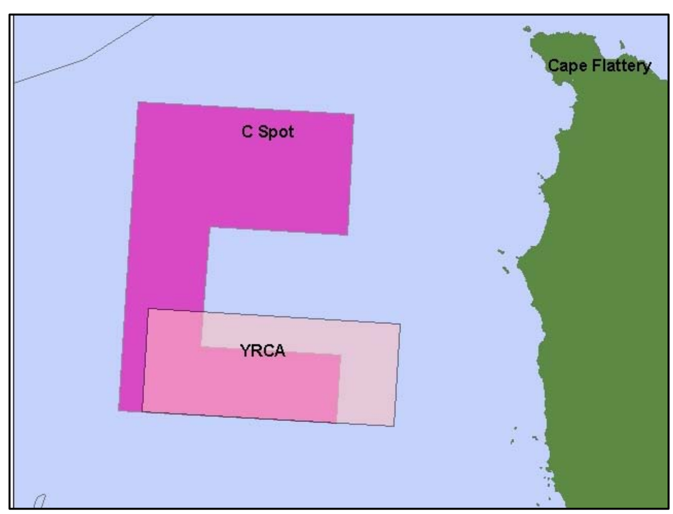
To examine this further, we plotted the coordinates of the closed areas with Geographic Information Systems (GIS) software with overlays of all available yelloweye rockfish encounter data. Data sources included state observer data from recreational, salmon troll, and exempted fisheries for trawl and longline, groundfish trawl logbook data, and data from the annual International Pacific Halibut Commission (IPHC) halibut survey, the National Marine Fisheries Service triennial trawl survey, and the WDFW submersible survey for yelloweye.

The geological structure of the area off the northern coast of Washington is high rocky relief, which yelloweye tend to inhabit, especially across a large area commonly referred to as "the prairie." It is important to note that, while there have been yelloweye caught on "the prairie," the data we have is an artifact of where the data have been collected. For example, the IPHC survey consistently sets on the same locations every year, so we cannot determine whether the catch-per-unit of effort for yelloweye is higher in one location than another, as the entire area has not been randomly surveyed. Additionally, observer data from the salmon troll fishery, as an example, was collected from "the prairie" as that is where a large proportion of the fishery takes place. Over the next two years, WDFW will work with constituents to collect additional data, and review the existing data in more detail, to evaluate additional yelloweye rockfish conservation areas that might be implemented in the future.

However, using the available data, WDFW has developed a new proposal for a yelloweye rockfish conservation area for 2007-08 that overlaps the southern portion of the "C-shaped" area, as depicted by the following coordinates:

Beginning at 48°00.00' N lat.; 125°16.00' W long.
Then to 48°06.00' N lat.; 125°16.00' W long.
Then to 48°00.00' N lat.; 124°54.00' W long.
Then to 48°06.00' N lat.; 124°54.00' W long.
and back to the point of origin.

This proposed yelloweye rockfish conservation area would be closed to all fishing, including trawl, fixed gear, recreational, and all open access fisheries.



Agenda Item F.2.c
Supplemental GAP Report
June 2006

GROUNDFISH ADVISORY SUBPANEL REPORT ON TENTATIVE ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

The Groundfish Advisory Subpanel (GAP) considered options for 2007-2008 optimum yields (OYs) for depleted groundfish species. There are three parts to this statement: the first contains general comments on current and future economic conditions in the groundfish fishery; the second covers OY recommendations for overfished species, including detailed justification rationale; and the third provides sector specific comments with over-arching impacts and respect to more than one species.

The GAP referenced Agenda Item F.2.a, Attachment 2; page 158, Table 7.69, for exvessel values. In addition, the GAP defines “take” in this document as the amount of catch expected to be harvested (including discard mortality). The GAP has also applied a 3:1 multiplier effect when identifying associated community impacts. The income impact multiplier for all groundfish is 2.16. The GAP believes that the community impacts are much more significant than income impacts alone and believes that the 3:1 multiplier is a more accurate depiction of overall community impacts. Recreational information comes from a National Marine Fisheries Service (NMFS) 2001 study “Technical Memorandum NMFS-F-SPO-49 October 2001.”

General Economic Conditions

Members of the GAP representing all sectors of the industry continue to voice their desire to be allowed to fish over the long term. Many interpretations of the Ninth Circuit Court’s ruling have been made. Taking into consideration the needs of fishing communities to avoid short-term disastrous consequences has different meanings to different stakeholders. However, one fact is undisputable: short-and long-term consequences to fishing communities are intrinsically linked. In order for there to be commercial and recreational fishing industries over the long term, short-term management measures must help preserve fishing businesses. More plainly said, if no fishing industry exists into the future because of overly extreme cuts in harvest then the Council has not taken into account the economic needs of fishing communities. If individual businesses continue to become depleted, necessary infrastructure within fishing communities that support commercial and recreational industries also become depleted. Once boats are tied to the dock, doors are closed, markets are lost, it isn’t just one season’s fishing foregone.

The GAP believes that some access to depleted species in order to catch healthy stocks is necessary to avoid disastrous short-term consequences to fishing communities. If communities and fishery sectors cannot survive short-term restrictions, longer-term efforts at sustainability apply only to the biology of fish – not to sustaining communities. The GAP believes the relationship between sustainable fishing communities and stable fisheries stocks is intrinsic, and preserving both for the long-term is not only worthwhile, but a necessity. With this in mind, the GAP notes the following with respect to the level of distress in the current fishery.

Generally from 1981 through 1997 the exvessel value of the commercial non-whiting groundfish fishery ranged from $80 to $100 million. In 1998, the first year of the groundfish disaster, the value of the entire non-whiting groundfish fishery was $61 million. The disaster was officially declared in 2000, and from 2002 through 2005 exvessel value of the fishery ranged from approximately $40 to $45 million. A difference of $40 to $55 million from the earlier period.

During this time of harvest cuts many fishing businesses and several seafood processors have gone out of business. Secondary and tertiary businesses associated with the fishing industry have also suffered. The additional hardship of increased fuel costs has only made it more difficult to maintain business plans.

Taking into consideration the needs of fishing communities goes beyond simple measures of changes in revenue. Socioeconomic effects should also be a major part of the discussion. For example, unemployment rates are higher for older individuals who have a more difficult time transitioning to new employment opportunities. This type of information is difficult to quantify but we know there are detrimental social consequences when businesses are suffering financially and closing their doors.

Incentives for improved science, management, and fishing practices should always be encouraged and explored. However, the one control the Council has for decision-making today on rebuilding plans is controlling fishing effort. Recreational and commercial fisheries have adapted to reduced harvests. Areas are now closed to protect overfished stocks. Essential fish habitat was established to protect spawning grounds and sensitive habitats. These reductions, closures, and other management measures are in place and there is evidence that stocks are rebuilding. Further reductions in harvest will harm the West Coast groundfish fishery and support industries without any meaningful gain in rebuilding times for most overfished species.

On the basis of the current distress in the fishery, the array of tradeoffs between present and future production, the levels of economic activities that each of these OYs affords, and affect on rebuilding times, the GAP has the following specific recommendations.

GAP Recommendations for OYs for Overfished Species

The following is a summary of the GAP recommendations:

Species	2007 OY	2008 OY
Bocaccio	218 mt	218 mt
Canary rockfish	44 mt	44 mt
Cowcod	8 mt	8 mt
Darkblotched rockfish	330 mt	330 mt
Pacific Ocean Perch	217 mt	217 mt
Widow rockfish	456 mt	456 mt
Yelloweye rockfish	Ramp down approach	Ramp down approach

BOCACCIO

Recommendation

The GAP recommends an OY of 218 mt for 2007 and 2008.

Fisheries Involved

Bocaccio is caught in the following fisheries occurring south of 40° 10'.

- Research Fisheries
- Limited Entry Trawl Non-whiting Fisheries
- Limited Entry Fixed-Gear Fisheries
- Open Access Directed Groundfish Fisheries
- Open Access Incidental Fisheries
    - California halibut
    - California gillnet
    - Coastal pelagic species wetfish
    - Pink shrimp
    - Ridgeback prawn
    - Salmon troll
- California Recreational Fisheries

Communities Impacted

There are at least 31 ports that could be impacted with a reduction in the amount of Bocaccio available. These communities are all located south of 40˚ 10' north latitude and include:
Albion, Bodega Bay, Fort Bragg, Point Arena, Point Reyes, Shelter Cover, Big Creek, Elk, Monterey, Moss Landing, Half Moon Bay, San Francisco, Santa Cruz, Avila, Berkeley, Dana Point, Long Beach, Mission Bay, Morro Bay, Newport Beach, Oceanside, Oxnard, Playa Del Rey, Point Loma, San Diego, San Pedro, San Simeon, Santa Barbara, Terminal Island, Ventura, and Wilmington.

Justification for Recommendation

- An OY of 218 mt represents an 80% probability of rebuilding. The median time to rebuild the stock under this alternative would be 2026, or five years longer than if a zero OY alternative were implemented.
- The Bocaccio biomass is increasing at an accelerated rate. Interactions with Bocaccio will continue to increase as the stock continues to rebuild.
- For 2007 and 2008 this represents an OY which is only 36% and 28% of the Council's preferred acceptable biological catch (ABC) of 602 mt and 618 mt, respectively.
- Dr. Alec McCall reports that there is strong evidence that two strong year classes are moving into the fishery.
- This fishery has already constrained or eliminated other fisheries, for example, the spot and ridgeback prawn trawl fisheries, the California halibut fishery, sea cucumber fishery, overall open access California groundfish fisheries, California limited entry trawl fishery and all of the California groundfish recreational fisheries.

Impacts of Lower OY Values

Limited Entry Trawl Non-whiting Fishery

Under a zero OY alternative, there would be no limited entry trawl non-whiting fishery south of 40˚10' N. Lat. This results in a loss of $2,600,000 exvessel value which equates to a $7,800,000 impact to affected communities.

Under the low OY alternative (40 mt), the limited entry trawl non-whiting fishery is expected to take 9.1 mt of Bocaccio (Table 2-14). In 2006, this same fishery is expected to take 47.9 mt of Bocaccio. This is an 80% reduction in catch, resulting in a $2,080,000 loss in exvessel revenues, which equates to $6,240,000 loss to affected communities.

Under the high OY alternative (218 mt), the limited entry trawl non-whiting fishery is expected to take 50.5 mt (Table 2-21). This number is more similar to the expected catch in 2006 and the higher OY allows a fishery similar to the status quo fishery, which is already severely constrained.

Limited Entry Fixed-Gear Fishery

Under a zero OY alternative there would be no limited entry fixed-gear fishery south of 40°10' N. lat. for shelf and nearshore rockfish. This results in a loss of $1,200,000 in exvessel revenue which equates to a $3,600,000 economic impact to the affected communities.

Under the low OY alternative (40 mt), the limited entry fixed gear fishery is expected to take 5.4 mt of Bocaccio (Table 2-14). This same fishery is expected to take 13.4 mt of Bocaccio in 2006. This is a 60% reduction in catch resulting in a loss of $720,000 in exvessel revenue which equates to $2,160,000 impact to affected communities.

Under the high OY alternative (218 mt), the limited entry fixed gear fishery is expected to take 13.4 mt of Bocaccio. The higher OY would allow a fishery similar to the status quo fishery, which is already severely constrained.

Open Access Directed Groundfish Fishery

Under a zero OY alternative the open access directed groundfish fishery south of 40°10' N. Lat. for shelf and nearshore rockfish would be eliminated. This results in a loss of $3,000,000 in exvessel value, which equates to a $9,000,000 economic impact to the affected communities.

Under the low OY alternative (40 mt), the open access directed groundfish fishery is expected to take 4.1 mt (Table 2-14). This is 6.5 mt less than the expected catch for 2006. This is a 37% reduction resulting in a loss of $1,110,000 exvessel values, which equates to a $3,330,000 economic impact to affected communities.

Under the high OY, alternative (218 mt), the open access directed groundfish fishery is expected to take 13.4 mt (Table 2-21). The higher OY option allows a near status quo fishery, which is already severely constrained.

California Recreational Fishery

Under a zero OY alternative all California recreational fisheries that encounter Bocaccio would be eliminated. This results in a loss of more than $1 billion to affected communities.

Under the low OY alternative (40 mt), the California recreational fishery is expected to take 16.0 mt (Table 2-14). This same fishery is expected to take 98.0 mt in 2006. This is an 84% reduction in catch and equates to an $840,000,000 economic impact to California communities.

Under the high OY alternative (218 mt), the California recreational fishery is expected to take 106.8 mt (Table 2-21). The high OY allows a status quo fishery, which is already severely constrained.

Maintaining Bocaccio catches at 2006 levels in order to prosecute fisheries on healthier stocks DOES NOT represent a profitable position for any of the fisheries which interact with Bocaccio. Using 2006 levels as a benchmark for measuring impacts is misleading in that 2006 levels are not reflective of healthy fishing communities. Total Bocaccio catches prior to the groundfish fishery disaster declaration in 2000 were significantly higher with 480 mt landed in 1997. The total catch expected in 2006 is just under 174 mt. This reflects a 64% reduction in Bocaccio catch as well as a higher percentage reduction in catches of associated species.

CANARY ROCKFISH

Recommendation

The GAP recommends a 44 mt OY for 2007 and 2008.

Fisheries Involved

Canary rockfish are caught in essentially all of the major fishery sectors including:

- Research Fisheries
- Tribal Fisheries
- Limited Entry Trawl Non-Whiting Fisheries
- Limited Entry Trawl Whiting Fisheries
- Limited Entry Fixed Gear Fisheries
- Open Access Directed Groundfish Fisheries
- Open Access Directed Incidental Groundfish Fisheries
    - California Halibut
    - Pink Shrimp
    - Salmon Troll
- Washington Recreational Fisheries
- Oregon Recreational Fisheries
- California Recreational Fisheries

Communities Involved

There are at least 46 ports that could be impacted by a reduction in the amount of canary rockfish available for harvest. These ports include: Aberdeen, Astoria, Bandon, Bellingham, Blaine, Brookings, Cathlamet, Charleston, Chinook, Crescent City, Depoe Bay, Eureka, Everett, Fields Landing, Florence, Garibaldi, Gold Beach, Ilwaco, La Push, Mill Creek, Neah Bay, Newport, Pacific City, Port Angeles, Port Orford, Port Townsend, Seattle, Tokeland, Trinidad, Westport, Winchester Bay, Albion, Avila, Bodega Bay, Fort Bragg, Point Arena, Point Reyes, Shelter Cover, Big Creek, Elk, Monterey, Morro Bay, Moss Landing, Half Moon Bay, San Francisco, and Santa Cruz.

Justification for Recommendation

- The most recent canary stock assessment reports that the biomass has been increasing since 2000. As the canary stock continues to rebuild the interaction with canary rockfish during fishing operations will continue to grow.
- Cooperative research currently being conducted indicates that some of the assumptions in the stock assessment surrounding older female fish are inaccurate and that inclusion of the new information would show the stock is actually more productive. Video Trawl research from the same project indicates a higher level of abundance than assumed in the stock assessment.
- The recommended OY is 7% less than the 2006 OY and 26% of the 2007 Council preferred ABC of 172 mt.
- Estimated catch for 2006 (44.3 mt) is higher than the high OY option (44 mt).

Impacts of Lower OY Values

Tribal Fishery

Under a zero OY alternative, the tribal fishery loses all groundfish and salmon fisheries resulting in an economic loss of $11,685,700 in exvessel revenue.

Limited Entry Trawl Non-Whiting Fishery (non-tribal)

Under a zero OY alternative, the limited entry trawl non-whiting fishery would be eliminated. This results in a loss of $6,500,000 in exvessel revenue, which equates to a $19,500,000 economic impact to affected communities.

Under the low OY alternative (32 mt), the limited entry non-whiting fishery is expected to take 3.7 mt (Table 2-14). In 2006 this same fishery is expected to take 7.8 mt. This would result in a 53% reduction in catch and results in a loss of $3,445,000 in exvessel revenue, which equates to a $10,335,000 economic impact to affected communities.

Under the high OY alternative (44 mt), the limited entry non-whiting fishery is expected to take 8.5 mt (Table 2-21). The high OY alternative allows a fishery similar to the status quo fishery, which is already severely constrained.

Limited Entry Trawl Whiting Fishery (non-tribal)

Under a zero OY alternative, the entire whiting fishery could be lost resulting in a $30 million exvessel loss, which equates to a $90 million economic impact to affected communities.

Under the low OY alternative (32 mt), a 3.0 mt hard cap would be imposed on the whiting fishery (Table 2-14). This equates to a 40% reduction from the hard cap in place for 2006. Based on this scenario, it is likely that 50% of the whiting OY would be unattainable, resulting in a $15 million exvessel revenue loss, which equates to a $45 million economic impact to affected communities.

Under the high OY alternative (44 mt), it is projected that the whiting fishery would take 5.5 mt (Table 2-21). If the 2006 hard cap of 4.7 mt is implemented there is the possibility that 15% of the fishery would be foregone if, due to the rebuilding paradox, canary rockfish are encountered at an accelerated rate and the hard cap is reached. 5.0% of the fishery equates to $4.5 million exvessel revenue loss, which equates to a $13.5 million economic impact to affected communities.

Limited Entry Fixed Gear Fishery (non-tribal)
Under a zero OY alternative, the limited entry fixed gear fishery would be eliminated. This results in a loss of $19,000,000 exvessel value and equates to $57,000,000 to affected communities.

Under the low OY alternative (32 mt), the limited entry fixed gear fishery is expected to take 0.1 mt (Table 2-14). This same fishery is expected to take 1.2 mt in 2006, resulting in a 98% reduction and a loss of $18,620,000 in exvessel revenue, which equates to a $55,860,000 economic impact to affected communities.

Under the high OY alternative (44 mt), the limited entry fixed gear fishery is expected to take .9 mt (Table 2-21), which results in a 25% reduction in catch and equates to a loss of $4,700,000 in exvessel value. This loss translates to a $14,250,000 economic impact to affected communities.

Open Access Directed Groundfish Fishery
Under a zero OY alternative, the open access directed groundfish fishery would be eliminated. This represents a loss of $8,000,000 in exvessel revenue, which equates to a $24,000,000 economic impact to affected communities.

Under the low OY alternative (32 mt), the open access directed groundfish fishery is expected to take 1.0 mt (Table 2-14). This same fishery is expected to take 3.0 mt of canary rockfish in 2006 resulting in a 66% reduction in catch and a loss of $5,280,000 in exvessel value which equates to a $15,840,000 economic impact to affected communities.

Under the high OY alternative (44 mt), the open access directed groundfish fishery is expected to take 2.1 mt (Table 2-21). The high OY alternative allows a fishery similar to the status quo fishery, which is already severely constrained.

California Recreational Fishery
Under a zero OY alternative the California recreational fisheries that encountered canary rockfish would be eliminated. This results in a loss of more than $1 billion to affected communities.

Oregon Recreational Fishery
Under a zero OY alternative, the Oregon recreational fisheries that encounter canary rockfish would be completely eliminated. This results in a loss of more than $45 million to affected communities.

Washington Recreational Fishery
Under a zero OY alternative, Washington recreational fisheries that take canary would be eliminated. This results in a loss of $5,000,000 to affected communities (includes total loss of halibut fishery, 50% loss of groundfish fishery, and 25% loss of salmon fishery due to depth restrictions – forced to stay inside of 30 fathoms).

Under the low OY alternative (12.6 mt), the Washington recreational fishery is expected to take 1.6 mt. This same fishery is expected to take 3.1 mt in 2006 which is an 80% reduction in catch which results in a loss of $4,000,000 to affected communities.

Maintaining canary catches at 2006 levels in order to prosecute fisheries on healthier stocks DOES NOT represent a profitable position for any of the fisheries which interact with canary rockfish. Using 2006 levels as a benchmark for measuring impacts is misleading in that 2006 levels are not reflective of healthy fishing communities.

Total canary rockfish catches prior to the groundfish fishery disaster declaration in 2000 were significantly higher with 1,309 mt landed in 1997. The total catch expected in 2006 is just over 44 mt. This represents a 97% reduction in catches of canary rockfish as well as a higher percentage reduction in catches of associated species.

COWCOD

Recommendation

The GAP recommends an OY of 8 mt for 2007 and 2008.

Fisheries Involved

Cowcod are caught in the following fisheries:

- Research Fisheries
- Limited Entry Trawl Non-Whiting Fisheries
- Limited Entry Fixed-Gear Fisheries
- Open Access Directed groundfish Fisheries
- California Recreational Fisheries

Communities Involved

There are at least 31 ports that could be impacted with a reduction in the amount of cowcod available. These communities are all located south of 38˚ 10' N. Lat. and include:
Albion, Bodega Bay, Fort Bragg, Point Arena, Point Reyes, Shelter Cover, Big Creek, Elk, Monterey, Moss Landing, Half Moon Bay, San Francisco, Santa Cruz, Avila, Berkeley, Dana Point, Long Beach, Mission Bay, Morro Bay, Newport Beach, Oceanside, Oxnard, Playa Del Rey, Point Loma, San Diego, San Pedro, San Simeon, Santa Barbara, Terminal Island, Ventura, and Wilmington.

Justification for Recommendation

- The ABC for cowcod more than tripled with the new assessment, from 5 mt to 17 mt. The OY for 2006 was 4.2 mt, 58% below the ABC. With a 17 mt ABC, the status quo rebuilding policy would result in an OY of 5 mt, 71% below the ABC. An OY of 8 mt would be 53% below the ABC, more aggressive rebuilding relative to the 2006 fishery.
- An 8 mt OY for cowcod represents an 80% probability of rebuilding on schedule.
- As this stock continues to be rebuilt, there will be higher incidence of interactions with this stock (rebuilding paradox).

Impacts of Lower OY Values

Limited Entry Trawl Non-Whiting Fisheries

A zero OY alternative would eliminate the limited entry trawl non-whiting fishery south of 40°10' N. Lat. resulting in a loss of $2,600,000 in exvessel value and $7,800,000 to the affected communities.

The low OY alternative (4 mt) results in an expected catch of 0.2 mt for the limited entry trawl non-whiting fishery (Table 2-14). This same fishery is expected to catch 2.7 mt in 2006. This results in a 93% reduction in catch and a loss of $2,418,000 in exvessel values, which equates to a $7,254,000 economic impact to affected communities.

The high OY alternative (8 mt) results in an expected catch of 2.9 mt for the limited entry trawl non-whiting fishery (Table 2-21). The high OY allows a status quo fishery, which is already severely constrained.

<u>Limited Entry Fixed-Gear Fisheries</u>
A zero OY alternative would eliminate the limited entry fixed gear fishery south of 40°10' N. Lat. This results in a loss of $1,200,000 in exvessel revenue and 3,600,000 to the affected communities.

Under the low OY alternative (4 mt) the limited entry fixed gear fishery is expected to take 0.1 mt of cowcod (Table 2-14). This is the same expected catch for 2006.

Under the high OY alternative (8 mt) the limited entry fixed gear fishery is expected to take 0.1 mt of cowcod (Table 2-21). The high OY alternative allows a status quo fishery, which is already severely constrained.

<u>Open Access Directed Groundfish Fisheries</u>
A zero OY alternative would eliminate the southern open access directed groundfish fishery. This results in a loss of $3,000,000 in exvessel value, which equates to a $9,000,000 economic impact to affected communities.

Under the low OY alternative (4 mt), the open access directed groundfish fishery is expected to take 0.1 mt (Table 4-45). This is the same catch expected for 2006.

Under the high OY alternative (8 mt), the open access directed groundfish fishery is expected to take 0.1 mt. This alternative allows for a status quo fishery, which is already severely constrained.

<u>California Recreational Fisheries</u>
Under a zero OY alternative, California recreational fisheries south of Point Conception would have to be eliminated. This results in a loss of approximately $500,000,000 to affected communities.

Under the low OY alternative, California recreational fisheries are expected to take 0.0 mt (Table 2-14). This same fishery is expected to catch 0.4 mt in 2006. This results in a 100% reduction in catch, which equates to a $500 million economic impact to affected communities.

Under the high OY alternative, California recreational fisheries are expected to take 0.3 mt (Table 2-21). The high OY allows a fishery similar to the status quo fishery, which is already severely constrained.

Maintaining cowcod catches at 2006 levels in order to prosecute fisheries on healthier stocks DOES NOT represent a profitable position for any of the fisheries which interact with cowcod rockfish. Using 2006 levels as a benchmark for measuring impacts is misleading in that 2006 levels are not reflective of healthy fishing communities. Total cowcod catches prior to the groundfish fishery disaster declaration in 2000 were higher with 9 mt landed in 1997. The total catch expected in 2006 is 3.4 mt, a reduction in catch of over 62%.

DARKBLOTCHED ROCKFISH

Recommendation

The GAP recommends an OY of 330 mt for 2007 and 2008.

Fisheries Involved

Darkblotched rockfish is currently taken in several West Coast fisheries including:

- Research Fisheries
- Tribal Fisheries
- Limited Entry Trawl Non-Whiting Fisheries
- Limited Entry Trawl Whiting Fisheries
- Limited Entry Fixed-gear Fisheries
- Open Access Directed Groundfish Fisheries

Communities Involved

There are at least 13 communities that could be impacted with a reduction in the amount of darkblotched rockfish available. These communities include Astoria, Bellingham, Blaine, Brookings, Charleston, Crescent City, Eureka, Ft. Bragg, Ilwaco, Neah Bay, Newport, and Westport.

Justification for Recommendation

- An OY of 330 mt is 72% of the Council's preferred ABC of 457 mt. The 330 mt OY results in a rebuilt stock by 2010.5, a 1 year increase from a zero OY alternative.
- As the darkblotched rockfish stock rebuilds, the interactions with these fish will continue to increase (rebuilding paradox).
- The current 200 mt OY was imposed as an interim OY pending the development of a rebuilding plan; it was not intended to be a rebuilding OY.
- Given higher occurrence of darkblotched, the current fishery could catch 284 mt, which is higher than the high OY option (229 mt).
- A 330 mt OY equates to rebuilding six months into the year 2010. A zero harvest OY equates to rebuilding six months into the year 2009. Both options equate to rebuilding during the *same* management cycle. It is estimated that you could set a 432 mt OY and darkblotched rockfish would still be rebuilt within the same management cycle (2010.9).

Impacts of Lower OY Values

<u>Tribal Fishery</u>

Under a zero OY alternative, the tribal bottom trawl fishery would be eliminated, resulting in a direct loss of $693,379 in exvessel revenue.

Limited Entry Trawl Non-Whiting Fishery (non-tribal)
Under a zero OY alternative, the limited entry trawl non-whiting fishery would be eliminated north of 38˚ N. Lat. This results in a loss of $14,300,000 in exvessel revenue which equates to a $42,900,000 economic impact to affected communities.
Under the low OY alternative, the limited entry trawl non-whiting fishery is expected to catch 66.7 mt (Table 2-14). This same fishery is expected to catch 248.9 mt in 2006. This is a 73% reduction in catch and equals $10,439,000 lost in exvessel revenues, which equates to a $31,317,000 economic impact to affected communities.

Under the high OY alternative, the limited entry trawl non-whiting fishery is expected to catch 181.1 mt (Table 2-21). This same fishery is expected to catch 248.9 mt in 2006. This is a 28% reduction in catch and equals a loss of $4,040,000 in exvessel revenues, which equates to a $12,012,000 economic impact on affected communities.

Limited Entry Trawl Whiting Fishery (non-tribal)
Under a zero OY alternative, the entire whiting fishery could be lost resulting in a loss of $30 million in exvessel revenue, which equates to a $90 million economic impact to the affected communities.

Under the low OY alternative (130 mt), the whiting fishery is expected to catch 8.6 mt (Table 2-14). In 2005 the whiting fishery took 16.5 mt of darkblotched rockfish. Under the 8.6 mt a 50% reduction would occur, resulting in a loss of approximately $15,000,000 in exvessel revenue which equates to a $45,000,000 economic impact to affected communities.

Under the high OY alternative (229 mt), the whiting fishery is expected to catch 16.2 mt (Table 2-21). Based on the darkblotched catch from 2005 only a slight loss would occur. However, under the rebuilding paradox, if darkblotched are encountered at an accelerated rate then the fishery could reach its darkblotched hard cap prior to the attainment of the whiting fishery causing economic loss.

Limited Entry Fixed Gear Fishery (non-tribal)
Under a zero OY alternative, the entire limited entry fixed gear fishery would be lost. This results in a loss of $12,000,000 in exvessel value and equates to a $36,000,000 economic impact to affected communities.

Under the low OY alternative (130 mt), the limited entry fixed gear fishery is expected to take 0.0 mt (Table 2-14). This same fishery is expected to take 1.3 mt in 2006. This represents a 100% decrease in catch and a loss of $12,000,000 in exvessel value that equates to a $36,000,000 economic impact to affected communities.

Under the high OY alternative (229 mt), the limited entry fixed gear fishery is expected to take 1.1 mt (Table 2-21). This results in a 16% decrease in catch or a loss of $1,920,000 in exvessel value, which equates to a $5,760,000 economic impact to affected communities.

Open Access Directed Groundfish Fishery
Under a zero OY alternative, the open access directed groundfish fishery on the slope north of 38˚ would be eliminated. This results in a loss of $1,900,000 in exvessel value which equates to a $5,700,000 economic impact to affected communities.

Under the low OY alternative, the open access directed groundfish fishery is expected to take 0.2 mt (Table 2-14). This same fishery is expected to take 0.2 mt in 2006.

Under the high OY alternative, the open access directed groundfish fishery is expected to take 0.2 mt (Table 4-43). The high OY alternative allows a status quo fishery, which is already severely constrained.

Maintaining darkblotched catches at 2006 levels in order to prosecute fisheries on healthier stocks DOES NOT represent a profitable position for any of the fisheries which interact with darkblotched rockfish. Using 2006 levels as a benchmark for measuring impacts is misleading in that 2006 levels are not reflective of healthy fishing communities. Total darkblotched catches prior to the groundfish fishery disaster declaration in 2000 were higher with 747 mt landed in 1997. The 2006 OY is 200 mt, a reduction in catch of about 73% as well as a higher percentage reduction in catches or associated species.

PACIFIC OCEAN PERCH

Recommendation

The GAP recommends an OY of 217 mt for 2007 and 2008.

Fisheries Involved

Pacific Ocean perch (POP) is currently taken in several West Coast fisheries including:

- Research Fisheries
- Tribal Fisheries
- Limited Entry Trawl Non-Whiting Fisheries
- Limited Entry Trawl Whiting Fisheries
- Limited Entry Fixed-Gear Fisheries
- Open Access Directed Groundfish Fisheries

Communities Involved

There are 11 ports that could be impacted by a reduction in the amount of Pacific Ocean Perch available. These communities include: Astoria, Bellingham, Blaine, Brookings, Charleston, Crescent City, Eureka, Ilwaco, Neah Bay, Newport, and Westport.

Justification for Recommendation

- A 217 mt OY is equal to 24% of the Council's preferred sustainable ABC of 900 mt in 2007.
- As POP continues to rebuild, interactions with the stock will continue to increase (rebuilding paradox).
- There are significant problems associated with attempting to rebuild a stock which is occurring on the extreme southern fringe of its geographic range. This stock has been under rebuilding scenarios of one kind or another for about thirty years. The GAP encourages the Council to consider whether we are attempting to manage to incorrect levels by not considering the biomass of the stock over a larger portion of its range.
- Estimated catch in 2006 (116.7 mt) is higher than the high OY alternative (100 mt).
- The high OY alternative (100 mt) results in a rebuilt stock in 2015.6 (just over six months through the year 2015). An OY of 217.5 results in a rebuilt stock in 2016.9. Both options equate to rebuilding during the *same* management cycle.

Impacts of Lower OY Values

Tribal Fishery

Under a zero OY alternative, the tribal bottom trawl fishery would be eliminated, resulting in a direct loss of $693,379 in exvessel revenue.

Limited Entry Trawl Non-Whiting Fishery (non-tribal)

Under a zero OY alternative the limited entry trawl non-whiting fishery would be eliminated north of 40°10'. This results in a loss of $12,000,000 in exvessel value, which equates to a $36,000,000 economic impact to affected communities.

Under the low OY alternative (44 mt) the limited entry trawl non-whiting fishery is expected to take 32.4 mt (Table 2-14). This same fishery is expected to take 102.6 mt in 2006. This results in a 69% reduction in catch and a loss of $8,280,000 in exvessel revenues, which equates to a $24,840,000 economic impact to affected communities.

Under the high OY alternative (100 mt) the limited entry trawl non-whiting fishery is expected to take 85.9 mt (Table 2-21). This results in a 16% reduction in catch and, a loss of $1,920,000 in exvessel revenues which equates to a $5,760,000 economic impact to affected communities.

Limited Entry Trawl Whiting Fishery (non-tribal)

Under a zero OY alternative, the entire whiting fishery could be lost resulting in a $30,000,000 loss to exvessel revenues, which equates to a $90,000,000 economic impact to affected communities.

Under the low OY alternative (44 mt), the whiting fishery is expected to take 3.0 mt of POP (Table 2-14). In 2003 and 2004, the whiting fishery caught 4 mt and 6 mt, respectively. The whiting fishery is expected to take 5.7 mt in 2006. This could result in 33-50% less POP available to the whiting fishery resulting in a loss of $10 to 15 million in exvessel revenues. This equates to a $30 to 45 million dollar economic impact to affected communities.

Under the high OY alternative (100 mt), the whiting fishery is expected to take 5.4 mt (Table 2-21). Based on catches in recent years, this may allow for full attainment of the whiting OY. However, based on implications of the rebuilding paradox and the rate of bycatch in the limited entry bottom trawl fishery, there is the possibility of losing part of the whiting OY.

Limited Entry Fixed-Gear Fishery (non-tribal)

Under a zero OY alternative, the limited entry fixed gear fishery would be eliminated north of 40°10' N. Lat. This results in a loss of $10,000,000 in exvessel value, which equates to a $30,000,000 economic impact to affected communities.

Under the low OY alternative (44 mt), the limited entry fixed gear fishery is expected to take 0.6 mt (Table 2-14). This same fishery is expected to take 0.4 mt in 2006. This results in a 33% reduction in catch and a loss of $3,300,000 in exvessel revenues, which equates to a $9,900,000 economic impact to affected communities.

Under the high OY alternative (100 mt), the limited entry fixed gear fishery is expected to take 0.6 mt (Table 2-21). This results in a 33% reduction in catch and a loss of $3,300,000 in exvessel revenues, which equates to a $9,900,000 economic impact to affected communities.

Open Access Directed Groundfish Fishery
Under a zero OY alternative, the open access directed groundfish fishery slope fishery north of 40°10' N. Lat. would be eliminated. This results in a loss of $1,500,000 in exvessel value and associated loss of $4,500,000 to affected communities.

Under the low OY alternative (44 mt), the open access directed groundfish fishery is expected to take 0.1 mt (Table 2-14). This same fishery is expected to take 0.1 mt in 2006.

Under the high OY alternative (100 mt), the open access directed groundfish fishery is expected to take 0.1 mt (Table 2-21). The high OY value allows a status quo fishery, which is already severely constrained.

Maintaining POP catches at 2006 levels in order to prosecute fisheries on healthier stocks DOES NOT represent a profitable position for any of the fisheries which interact with POP. Using 2006 levels as a benchmark for measuring impacts is misleading in that 2006 levels are not reflective of healthy fishing communities. Total POP catches prior to the groundfish fishery disaster declaration in 2000 were higher with 751 mt caught in 1997. The total catch expected in 2006 is 116.7 mt, a reduction in catch of over 85% as well as a higher percent reduction in catches of associated species.

WIDOW ROCKFISH

Recommendation
The GAP recommends an OY of 456 mt for 2007 and 2008.

Fisheries Involved
Widow rockfish are currently taken in several West Coast fisheries including:

- Research Fisheries
- Tribal Fisheries
- Limited Entry Trawl Non-Whiting Fisheries
- Limited Entry Trawl Whiting Fisheries
- Limited Entry Fixed Gear Fisheries
- Open Access Directed Groundfish Fisheries
- Open Access Incidental Groundfish Fisheries
    - Pink shrimp
    - Salmon troll
- Oregon Recreational Fisheries
- California Recreational Fisheries

Communities Involved
There are at least 11 ports that could be impacted with a reduction in the amount of widow rockfish available. These communities include Astoria, Charleston, Crescent City, Eureka, Fort Bragg, Bodega Bay, San Francisco, Ilwaco, Newport, Seattle and Westport.

Justification for Recommendation

- A 456 mt OY is equal to 8% of the Council's preferred sustainable ABC of 5,334 mt in 2007. This OY corresponds to a rebuilding plan which results in the stock being rebuilt by 2016, 3 years longer than zero harvest.
- The most recent stock assessment revealed that widow rockfish was never overfished and is rebuilding rapidly.
- Interactions with widow rockfish will continue to increase as the stock continues to grow (rebuilding paradox).
- A 456 mt OY equates to rebuilding in 2016. The preferred high OY (368 mt) results in the stock being rebuilt in 2015. Both options equate to rebuilding during the *same* management cycle. It is estimated that an OY of approximately 440 mt would result in a rebuilt stock in 2015.9.
- The 2005 stock assessment indicates that in 2004 the widow stock was not overfished and in 2004 was above the overfished level at 31% of the unfished biomass.

Impacts of Lower OY Values

<u>Tribal Fisheries</u>

Under a zero OY alternative, the mid-water trawl and whiting fishery would be eliminated resulting in a $4,752,058 loss in exvessel revenue.

<u>Limited Entry Trawl Non-Whiting Fishery</u>

Under a zero OY alternative, the entire limited entry trawl non-whiting shelf fishery could be eliminated. This results in a loss of $6,900,000 in exvessel value, which equates to a $20,700,000 economic impact to affected communities.

Under the low OY alternative (120 mt), projected catch of widow rockfish in the limited entry non-whiting fishery would be reduced to 0.1 mt (Table 2-14). This same fishery is expected to take 0.6 mt of widow in 2006. This results in an 83% reduction in catch and a loss of $5,727,000 in exvessel revenue, which equates to a $17,181,000 economic impact to affected communities.

Under the high OY alternative (368 mt), the limited entry trawl non-whiting fishery is expected to take 1.0 mt (Table 2-21). The high OY alternative could allow a status quo fishery, which is already severely constrained.

<u>Limited Entry Trawl Whiting Fishery</u>

Under a zero OY alternative the entire whiting fishery would be lost resulting in a $30 million dollar loss at the exvessel level. This equates to a $90 million dollar economic impact to affected communities.

Under the low OY alternative, the whiting industry hard cap would be reduced to 64.9 mt (Table 2-14). This equates to a 66% reduction from the hard cap in place for 2006. Twenty million in lost exvessel revenues could be associated with the loss of access to the healthy whiting OY based on the reduction in widow rockfish available (66% of a $30 million dollar fishery). This equates to a $60 million dollar economic impact to the affected communities.

Under the higher OY alternatives, it is assumed that the 200 mt hard cap for the whiting fishery would remain in place. It is difficult to predict whether losses would occur under this scenario. While 200 mt is the hard cap in place for 2006, due to the circumstances of the rebuilding paradox it is unclear whether or not a 200 mt hard cap will affect the 2006 fishery. Presumably as the stock continues to rebound, harvesters in the whiting fishery will continue to encounter widow rockfish at higher rates.

Limited Entry Fixed-Gear Fishery

Under a zero OY alternative the limited entry fixed gear fishery would be eliminated. This results in a loss of $1,800,000 in exvessel value, which equates to a $5,400,000 economic impact to affected communities.

Under the low OY alternative (120 mt), the limited entry fixed gear fishery is expected to catch 0.5 mt (Table 2-14). This same fishery is projected to take 0.5 mt in 2006.

Under the high OY alternative (368 mt), the limited entry fixed gear fishery is expected to take 0.5 mt (Table 2-21).

Open Access Directed Groundfish Fishery

Under a zero OY alternative, the open access directed groundfish fishery would be eliminated. This results in a loss of $3,000,000 in exvessel value which equates to a $9,000,000 economic impact to affected communities.

Under the low OY alternative (120 mt), the open access directed groundfish fishery is expected to take 0.1 mt (Table 2-14).

Under the high OY alternative (368 mt), the open access directed groundfish fishery is expected to take 0.1 mt.

Oregon Recreational Fisheries

Under a zero OY alternative, Oregon recreational fisheries associated with widow rockfish would be eliminated resulting in a loss of $3,200,000 to affected communities.

Under the low OY alternative (120 mt), the Oregon recreational fishery is expected to take 0.5 mt. This same fishery is expected to take 1.4 mt in 2006. This equates to a 65% reduction in catch and a loss of $2,080,000 in exvessel value which equates to a $6,240,000 economic impact to affected communities.

Under the high OY alternative (368 mt), the Oregon recreational fishery is expected to take 1.4 mt.

California Recreational Fisheries

Under a zero OY alternative, California recreational fisheries associated with widow rockfish would be eliminated resulting in a loss of $1 billion to affected communities.

Under the low OY alternative (120 mt), the California recreational fishery is expected to take 1.6 mt (Table 2-14). This same fishery is expected to take 8.0 mt in 2006. This results in an 80% reduction in catch and a loss of $800 million to affected communities.

Maintaining widow rockfish catches at 2006 levels in order to prosecute fisheries on healthier stocks DOES NOT represent a profitable position for any of the fisheries which interact with widow rockfish. Using 2006 levels as a benchmark for measuring impacts is misleading in that 2006 levels are not reflective of healthy fishing communities. Total widow catches prior to the groundfish fishery disaster declaration in 2000 were higher with 6,492 mt caught in 1997. The total catch expected in 2006 is 258 mt, a reduction in catch of over 96% as well as a higher percentage reduction in catches of associated species.

YELLOWEYE ROCKFISH

Recommendation

The GAP recommends a ramp-down approach for yelloweye rockfish which results in the following OYs:

- 2007 OY, 23 mt
- 2008 OY, 20 mt
- 2009 OY, 17 mt
- 2010 OY, 15 mt

Fisheries Involved

Yelloweye rockfish are currently caught in several fisheries including:

- Research Fisheries
- Tribal Fisheries
- Limited Entry Trawl – Non Whiting Fisheries
- Limited Entry Fixed Gear Fisheries
- Open Access Directed Groundfish Fisheries
- Open Access Incidental Groundfish Fisheries
    - Pink shrimp
    - Salmon troll
- Washington Recreational Fisheries
- Oregon Recreational Fisheries
- California Recreational Fisheries

Communities Involved

There are at least 31 ports that could be impacted by lower amounts of yelloweye available. These ports include: Aberdeen, Astoria, Bandon, Bellingham, Blaine, Brookings, Cathlamet, Charleston, Chinook, Crescent City, Depoe Bay, Eureka, Everett, Fields Landing, Florence, Garibaldi, Gold Beach, Ilwaco, La Push, Mill Creek, Neah Bay, Newport, Pacific City, Port Angeles, Port Orford, Port Townsend, Seattle, Tokeland, Trinidad, Westport, and Winchester Bay.

Justification for Recommendation

- This "ramp-down" approach incorporates a reduced OY on a yearly basis; however the proposal from the GAP would set 15 mt as the lower bound on the OY. The GAP notes that under the first year of this ramp-down approach the OY would be 23 mt, 36% below the ABC of 36 mt. The 2007 OY also represents a 15% reduction from 2006. Under a ramp-down to 13.5 mt, it is estimated that rebuilding times could increase by approximately 7 months.

- The GAP believes the yelloweye stock will be rebuilding under this scenario in the shortest time possible while taking into consideration the biology of the stock and the needs of the fishing communities

Impacts of Lower OY Values

Tribal Fishery

Under a zero OY alternative, the tribal fishery loses all groundfish and salmon fisheries resulting in an economic loss of $11,685,700 in exvessel revenue.

Limited Entry Trawl – Non Whiting Fisheries

Under a zero OY alternative, the limited entry trawl non-whiting shelf fishery north of 36° N. Lat. would be eliminated. This results in a loss of $6,500,000 in exvessel revenue, which equates to a $19,500,000 economic impact to the affected communities.

Under the low OY alternative (12.6 mt), the limited entry trawl non-whiting fishery is expected to take 0.1 mt (Table 2-14). This same fishery is expected to take 0.1 mt in 2006.

Under the high OY alternative (23 mt in 2007), the limited entry trawl non-whiting fishery is expected to take 0.3 mt (Table 2-21).

Limited Entry Fixed Gear Fisheries

Under a zero OY alternative, the limited fixed gear fishery north of Point Conception would be eliminated. This results in a loss of $15,000,000 in exvessel revenue which equates to a $45,000,000 economic impact to affected communities.

Open Access Directed Groundfish Fisheries

Under a zero OY alternative, the open access directed groundfish fishery north of 40˚10' N. Lat. would be eliminated. This results in a loss of $5,400,000 in exvessel revenue, which equates to a $16,200,000 economic impact to affected communities.

Under the low OY alternative (12.6 mt), the open access directed groundfish fishery is expected to take 0.9 mt (Table 2-14). This same fishery is expected to take 3.0 mt in 2006. This results in a 70% reduction in catch and a loss of $3,780,000 in exvessel revenues, which equates to an $11,340,000 economic impact to affected communities.

Washington Recreational Fisheries

Under a zero OY alternative Washington recreational fisheries that take yelloweye would be eliminated. This results in a loss of $5,000,000 to affected communities (includes total loss of halibut fishery, 50% loss of groundfish fishery, 25% of salmon fishery due to depth restrictions – forced to stay inside of 30 fathoms).

Under the low OY alternative (12.6 mt), the Washington recreational fishery is expected to take 1.6 mt. This same fishery is expected to take 3.1 mt in 2006, an 80% reduction in catch, which results in a loss of $4,000,000 to affected communities.

Oregon Recreational Fisheries

Under a zero OY alternative, Oregon recreational fisheries that take yelloweye would be eliminated. This results in a loss of $45,000,000 to affected communities.

Under the low OY alternative (12.6 mt), the Oregon recreational fishery is expected to take 1.5 mt. This same fishery is expected to take 3.6 mt in 2006 and results in a 59% reduction in catch and a loss of $26,550,000 to affected communities.

California Recreational Fisheries

Under a zero OY alternative, California recreational fisheries that take yelloweye would be eliminated. This results in a loss of $400,000,000 to affected communities.

Under the low OY alternative (12.6 mt), the California recreational fishery is expected to take 1.2 mt (Table 4-45). This same fishery is expected to take 3.7 mt in 2006. This results in a 68% decrease in catch and a loss of $272 million to affected communities.

Sector Specific Comments

California Fixed Gear Fishery

Under the low Bocaccio OY, all recreational and commercial shelf rockfish opportunity would be forced to access shelf species at no deeper than 30 fathoms. This would eliminate access to valued shelf species such as vermillion rockfish as they tend to be in deeper water in the southern California bight. This would also increase pressure on non-assessed nearshore species. The commercial fixed gear impact for directed groundfish fisheries would be $37,500 per limited entry vessel per year. The open access fleet could lose $9,300 per vessel per year. With increasingly smaller profit margins, this amount of a reduction in profit would likely be the end of their businesses.

Northern Open Access Directed Groundfish Fishery

Reducing the catch of midwater schooling black and blue rockfish is the least effective and most expensive way to protect yelloweye stocks. Limiting benthic species that share habitat with yelloweye by moving into shallower water is a much more effective and less costly alterative. The reduction of any catch in open access affects the most impoverished small boats and ports of the northern California and Oregon coast. The ports of Humboldt, Crescent City, Gold Beach, Pacific City and Port Orford all earned vulnerable category status. Garibaldi earned a most vulnerable title. This lost revenue must all come from the profit side of these small businesses. Due to the reduction imposed on our industry over the last six years, any lost income will have a much harsher outcome to open access fishers. Their profit margins have been eroded by raising costs without coinciding price increases. The cost of living has also gone up. This is a critical period for open access fishermen. A reduction in profits would put all open access nearshore fishermen at risk of bankruptcy. In Crescent City alone, 15 fishermen would be displaced. Each of these fishermen rely on rock cod for over ½ their yearly income. Cutting catches would make it impossible to maintain their yearly cash flow.

Southern Open Access

Any reduction in catch of the open access fishery causes a great reduction in profit. Open access boats for the directed groundfish fishery south of 40°10' N. Lat. are generally small vessels run by single family, small businessmen. In some ports, these vessels comprise a large percentage of the fleet.

California Recreational Fishery

It is difficult to estimate the social and economic value of recreational fishing. The groundfish draft environmental impact statement notes that the values they calculated were drawn from the dollars anglers spent pursuing the fishery. In 2005 for example, California Recreational Fisheries

Survey data in northern California records almost 57,000 angler trips for the months of September and October. If "Action Alternative 2" were adopted by the Council, and forced an additional closure for the month of October in north-central, it would lead to a loss of almost $3 million in recreational fishing expenditures.
Another indicator of lost revenue to the state of California is the steady decline of sport fishing license sales. CDFG reports that annual resident licenses sales are down from 2.2 million in 1976 to 1.2 million in 2005. During that time the population of California grew 166%, from 21 to 35 million people, but we lost a million anglers with a drop in sales of 54%. This decline in license sales has cost CDFG over $32 million at a time when budget cuts leave current regulations unenforced because of the lack of wardens in the field.

The fishing public's uncertainty about the allowed species, changing bag limits and seasons remains the prime culprit for this lost revenue. The public has turned away from fishing because they do not understand the rules. The Council should support California Department of Fish and Game (CDFG’s) efforts to simplify the regulations. The main change recreational stakeholders in the north-central region have requested: is expansion of the open depths out to 40 fathoms. We support this mainly for conservation reasons - no additional fish will be taken, despite the estimates in the analysis. The change will merely spread the effort away from minor nearshore rockfish.

The draft DEIS does not include the social value of recreational fishing. Dollar signs cannot describe the value of families fishing for food and fun.

Oregon Recreational Fishery
The charter fleet in Oregon has been reduced from 232 boats in 2001 to 94 boats sampled in 2005. About 25% of the 94 boats are NOT full-time operators – many are small 6-pack boats that are on trailers and may only operate on weekends. Management measures implemented since 2001 have greatly reduced and changed the make-up of the fleet. Many of the full-time operators have already gone out of business. The few full-time operators that are left are barely holding on. As management continues to tighten up it takes less and less restrictions to break the remaining participants.

Under low OY conditions the Oregon recreational fishery stands to lose at least $7.5 million. This equates to 35,187 private trips and 71,427 charter trips lost.

Washington Recreational Fishery
For the Washington recreational fleet, – both private and charter operations are operating under restrictions that are difficult to live with currently and further reductions and restrictions will be devastating. Businesses in all sectors, (hotel/motel, bait and tackle shots, charter offices, etc.) are showing a downturn of as much as 1/3 in revenues from this time last year. This is a cumulative effect of short halibut seasons, fathom restrictions, fuel prices, and a poor economy. Many charter operations have been operating on the margin and any further restrictions are likely to break them and place the stronger businesses into their position. A zero OY on yelloweye, short halibut seasons, reduced salmon opportunity, and bad press involving albacore could result in a fleet reduction similar to the collapse of the salmon in the early eighties. There are no immediately feasible fisheries to fall back on. On Table 7-71 Summary of Percentage Change in Recreational Income Impacts it lists the south and central Washington coasts as 0.0% change, due to the fact that these areas can no longer reduce their take of yelloweye. The assumption that

further restricting opportunity in these areas will result in no change in income is ludicrous. Businesses are substantially reduced because of this year's management measures. Loss of revenue from a zero OY on canary or yelloweye will result in a loss in excess of $5 million.

PFMC
06/13/06

California (All)

Table 7. California (All) Total Expenditures by Resident Status, 2000 (in thousands of dollars).

CALIFORNIA (ALL)		Total	Upper Bound	Lower Bound	Total	Upper Bound	Lower Bound
Trip Expenditures	**Mode**		**Residents**			**Non-Residents**	
Private Transportation	Party/Charter	12,272	13,320	11,225	10,438	11,872	9,004
	Private/Rental	24,958	13,320	21,428	7,170	9,117	5,224
	Shore	23,634	27,494	19,774	3,776	4,929	2,624
Food	Party/Charter	13,873	15,182	12,565	5,304	6,189	4,418
	Private/Rental	21,347	24,597	18,096	1,937	2,477	1,396
	Shore	17,655	20,704	14,605	1,329	1,818	841
Lodging	Party/Charter	2,695	3,603	1,788	8,672	10,532	6,812
	Private/Rental	4,400	5,695	3,104	1,930	3,065	796
	Shore	11,906	15,183	8,629	1,970	2,959	980
Public Transportation	Party/Charter	793	1,462	124	33,938	42,330	25,546
	Private/Rental	169	306	32	4,343	7,763	924
	Shore	860	1,214	506	1,316	2,464	168
Boat Fuel	Private/Rental	31,059	36,118	25,999	1,890	2,570	1,210
Party/Charter Fees	Party/Charter	57,712	63,353	52,071	6,367	7,577	5,158
Access/Boat Launching	Party/Charter	972	1,198	746	391	573	208
	Private/Rental	3,771	4,414	3,128	257	369	146
	Shore	1,846	2,253	1,439	169	363	0
Equipment Rental	Party/Charter	2,541	3,184	1,899	4,789	6,416	3,162
	Private/Rental	1,859	2,355	1,363	576	978	174
	Shore	1,477	2,042	912	131	243	19
Bait & Ice	Party/Charter	740	954	525	316	433	199
	Private/Rental	17,386	20,110	14,662	1,020	1,341	700
	Shore	6,297	7,767	4,828	332	461	204
Total	Party/Charter	91,599	93,742	85,565	70,216	79,210	61,222
	Private/Rental	104,949	118,417	97,307	19,125	23,344	14,906
	Shore	63,675	69,816	57,534	9,024	11,007	7,042
Annual Expenditures			**Residents**			**Non-Residents**	
Rods and Reels		87,379	100,428	74,329			
Other Tackle		61,712	71,043	52,382			
Gear		14,152	16,610	11,694			
Camping Equipment		7,090	9,770	4,409			
Binoculars		1,963	2,526	1,401			
Clothing		9,280	11,958	6,601			
Magazines		3,067	3,742	2,393			
Club Dues		2,404	3,150	1,658			
License Fees		35,296	39,378	31,215			
Boat Accessories		230,663	317,031	144,296			
Boat Purchase		688,820	831,723	545,917			
Boat Maintenance		167,606	194,586	140,625			
Fishing Vehicle		638,561	918,489	358,632			
Fishing Vehicle Maintenance		155,872	195,703	116,041			
Vacation Home		11,495	23,523	0			
Vacation Home Maintenance		5,316	8,918	1,715			
All Sub-Totals		2,380,901	2,711,403	2,050,536	98,365	108,495	88,235
State Total		2,479,266	2,809,924	2,148,746			

GROUNDFISH MANAGEMENT TEAM REPORT ON TENTATIVE ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

At its April 2006 meeting, the Council adopted final preferred alternatives for acceptable biological catches (ABCs) for all species and optimum yields (OYs) for non-overfished species. These values are listed in Table 2-1 in the Preliminary Draft Environmental Impact Statement (DEIS) (pages 3-5 in Agenda Item F.2.a, Attachment 1).

In its April 2006 statement for 2007-2008 management specifications (Agenda Item F.1.c., Supplemental GMT Report) the GMT discussed the Council's direction for this management period to "rebuild [overfished species] as quickly as possible, taking into account the status and biology of the stock, the needs of fishing communities, and the interaction of these stocks within the marine ecosystem." The Council provided further direction at that meeting, selecting two suites of preferred overfished species OYs from the lower end of the rebuilding OY range initially slated for analysis. These two alternatives were labeled at that meeting as the "Preferred Low OY" and "Preferred High OY" alternatives.

Under this agenda item, the Council is expected to make final decisions on OYs for overfished species. Additionally, if the Council wants to consider 2007 exempted fishing permits (EFPs), some yield of overfished species needs to be set-aside to accommodate EFP catch. The Council should also provide guidance on recreational harvest guidelines for canary and yelloweye rockfish. These actions will allow the Groundfish Management Team (GMT) and Groundfish Advisory Subpanel (GAP) to focus on recommendations for preferred management measures under Agenda Items F.5 and F.6.

Analytical documents available at this meeting look at the effects of the different OY levels on the environment, focusing on three Action Alternatives. Action Alternative 1 presents a management measures regime based on the Preferred Low OY alternative. Action Alternatives 2 and 3 present management regimes based on the Preferred High OY alternative, but emphasizing different fishing strategies. Summary descriptions of the action alternatives are provided in Agenda Item F.2.a., Supplemental Attachment 5, "Summary of the Biological and Socioeconomic Effects of the 2007-2008 Action Alternatives."

With regard to setting the OYs for overfished species, the Council needs to be aware of the differences in the biology of the different rockfish stocks and, as a result, the varying rebuilding schedules. Table 2-3 and Figure 2-2 in Chapter 2 of the Preliminary DEIS present the rebuilding parameters of the overfished stocks. Figure 2-2 displays the rebuilding yields and the resulting differences in median times to rebuild. Stocks with steep slopes, such as darkblotched, Pacific ocean perch (POP), and widow rockfish, are more productive; stocks with relatively flat lines, such as cowcod and yelloweye, are considerably less productive. Stocks with low productivity will take much longer to rebuild, even in the absence of fishing. Table 2-3, excerpted below, shows a variety of OYs and median times to rebuild, including those for states of no fishing (F=0), and for fishing at the Preferred Low OY and Preferred High OY levels.

	Action Alt. 1 OYs	Rebuilt Date	Action Alts. 2 & 3 OYs	Rebuilt Date	F=0 Rebuilt Date
Bocaccio	40 mt	2021.9	218 mt	2026	2021.1
Canary rockfish	32 mt	2060	44 mt	2063	2053
Cowcod	4 mt	2039	8 mt	2043	2035
Darkblotched rockfish	130 mt	2009.9	229 mt	2010.2	2009.5
Pacific ocean perch	44 mt	2015	100 mt	2015.6	2014.6
Widow rockfish	120 mt	2014	368 mt	2015	2013
Yelloweye rockfish	12.6 mt	2083	23 mt '07 20 mt '08	2083.5	2048

Comparison of years to rebuild (years) for F=0, status quo OY, and OY alternatives for 2007							
	Bocaccio	Canary	Cowcod	DKBL	POP	Widow	Yelloweye
Years to rebuild at F=0	15.1	48.0	29.0	3.5	8.6	7.0	42.0
Years to rebuild at status quo (i.e.: 2006 OY)	23.0	58.4	33.1	4.1	16.5	8.8	113.5
Years to rebuild at Preferred Low OY alternative	15.9	54.0	33.0	3.9	9.0	8.0	77.0
Percent difference in years to rebuild (Preferred Low OY vs. status quo)	-30.9%	-7.5%	-0.3%	-4.9%	-45.4%	-9.1%	-32.2%
Years to rebuild at Preferred High OY alternative	20.0	57.0	37.0	4.2	9.6	9.0	77.5
Percent difference in years to rebuild (Preferred High OY vs. status quo)	-13.0%	-2.4%	11.8%	2.4%	-41.8%	2.3%	-31.7%

Estimates of rebuilt dates for F=0 illustrate **how soon it is possible for each stock to recover to $\mathbf{B_{MSY}}$,** given life history and environmental constraints in the absence of fishing beginning in 2007. These rebuilt date estimates are based on the most recent stock assessments for these species. Depending on data and methods used, the rebuilt dates for these species could be revised in future stock assessments, even in the absence of fishing.

In our April 2006 statement on 2007-2008 harvest levels, we recommended, and we continue to recommend, that the Council **take into account the status and biology of the stocks** by:

- Looking at the depletion rates of each overfished species and the sensitivity of those species to changes in OY to structure suites of OYs that focus protection on the more sensitive species. The species with rebuilding times that are most sensitive to changes in OY are canary rockfish, yelloweye rockfish, and cowcod. We believe that the suites of Preferred Low and Preferred High OYs appropriately focus greater protection on the species more sensitive to OY changes.

- We also recommended that the OYs for overfished species include allowances for research catch, in order to ensure that future information could be gathered on the status and biology of these and other fish stocks. In setting the Preferred High OY alternative, the Council heeded our advice and included research catch amounts in the component overfished species OYs. Extractive scientific research under the Preferred Low OY alternative would come at a cost of further lost fishing opportunity. For the purpose of estimating economic effects of the Preferred Low OY alternative, the GMT assumed that there would be no Exempted Fishing Permits (EFPs) under that alternative.

In order to ensure that overfished species are managed within their rebuilding OYs, projected overfished species mortalities are modeled at the beginning of the year, and subsequent adjustments to management measures are made inseason to keep total catch within the OYs. However, there is uncertainty in both the stock assessments and pre-season projections that need to be considered when setting the rebuilding OYs. Taking this uncertainty into consideration, the GMT makes recommendations below on OYs for specific overfished species.

In its guidance on **taking into account the needs of fishing communities**, the 9th Circuit Court of Appeals stated, “The purpose of the [Magnuson-Stevens] Act is clearly to give conservation of fisheries priority over short-term economic interests. The Act sets this priority in part because the longer-term economic interests of fishing communities are aligned with the conservation goals set forth in the Act.” The 9th Circuit goes on to state “The natural reading of this language, however, is that Congress intended to ensure that overfished species were rebuilt as quickly as possible, but wanted to leave some leeway to avoid disastrous short-term consequences for fishing communities.”

We discussed the three action alternatives and the zero harvest alternative and their effects on fishing communities in terms of: short term economic impacts compared to status quo, short term economic impacts compared to historic economic impacts, short term economic impacts compared to the 2000 disaster declaration by the Secretary of Commerce, and short term economic impacts of each action alternatives when compared to one another. While there is currently no definition that establishes a threshold for identifying “disastrous short term consequences,” there are several precedents that help put the economic impacts of the action alternatives into perspective:

- The Secretary of Commerce’s 2000 commercial fishery disaster declaration for the groundfish fishery;
- The US department of Agriculture defines severe production losses in a county as a reduction countywide of at least 30 percent; and
- The Small Business Administration will make a physical disaster declaration when at least three businesses have uninsured losses of 40% or more of their estimated fair replacement value.

Under the status quo fishery, revenues are lower than when compared to revenues generated in 2000, the year of the disaster declaration. In 2000, 2001, and 2002 groundfish exvessel revenues were approximately $62 million, $52 million, and $43 million respectively. Recreational angler trips numbered an estimated 1,218,000 in 2000, 927,000 in 2001, and 843,000 in 2002.

The action alternatives result in exvessel revenue, recreational angler trips, and income impacts that continue to be lower than when the disaster declaration was made. Changes in personal income are lowest under action alternative 1 and this alternative reduces personal income by $57.6 million from status quo levels (see table 7-68g, page 505 of the Preliminary DEIS). The percent change in income impacts (compared to status quo) under action alternative 1 reduces personal income by more than 40% for many port groups. Action Alternative 2 reduces commercial groundfish fishery income by more than 20% for some port groups. Action Alternative 3 reduces commercial groundfish fishery income by less than 15% for all port groups (see Table 7-70, page 510 of the Preliminary DEIS). Recreational fisheries follow the same general pattern. Action Alternative 1 reduces recreational groundfish personal income by more than 40% for some regions. Action Alternative 2 reduces personal income by more than 40% for some regions. Action Alternative 3 reduces recreational groundfish personal income by more than 25% for several regions, and more than 30% for one region (see Table 7-71, page 511 of the Preliminary DEIS).

In addition to those short-term and large-scale effects of the 2007-2008 action alternatives that are predictable pre-season, the GMT is also concerned with the less predictable effects of the Preferred Low OY alternative, which supports Action Alternative 1. In our April statement on 2007-2008 harvest specifications, we reminded the Council of the uncertainty inherent in inseason groundfish fisheries management, stating "information available on the different fisheries varies in both its quality and abundance – both pre-season, and as we proceed through the seasons." The Preferred Low OY/Action Alternative 1 requires a variety of fisheries to be either severely constrained or closed by January 1, 2007. Any flexibility to respond to management uncertainty would require further closures and constraints upon severely constrained fisheries. It is also expected that the Preferred Low OY/Action Alternative 1 could trigger a host of inseason fishery closures to accommodate fishery information received inseason.

Chapter 3 of the Preliminary DEIS **takes into account the interaction of overfished species within the marine ecosystem**. The rebuilding rockfish stocks on the West Coast and all rockfish more generally, occupy a broad range of ecological niches and trophic roles in the California Current ecosystem, since both juvenile and adult rockfish are important prey items to a wide range of other rockfish, other piscivorous fishes, seabirds and marine mammals. From a holistic perspective, the fishing down of any species, whether to or below target levels, alters energy pathways and has the potential to affect ecological structure. Unfortunately, the research and data necessary to understand such potential impacts, or to develop and adequately parameterize multispecies models to evaluate such impacts reliably, are lacking for most ecosystems, including the California Current.

As a result, there is no foundation upon which to consider the consequences of historical overfishing, or alternative strategies in rebuilding depleted species, with respect to the potential effects or trade-offs to ecological integrity and future sustainability. For several rebuilding species, particularly those at higher trophic levels (piscivorous species such as cowcod, yelloweye and bocaccio), these impacts may be more significant at smaller spatial scales for some habitat types and regions. Existing spatial closures for essential fish habitat protection and overfished species bycatch reduction should provide adequate protection to sustain ecological relationships and interactions. However, there is no meaningful way of quantitatively assessing the risk of undesirable consequences to the ecosystem of choosing one OY alternative over the other. As the estimated impacts to the rebuilding trajectories for most of these species are forecast to be relatively modest, it stands to reason that the potential consequences of the differing OY alternatives to the ecosystem are also relatively modest.

Specific Overfished Species OYs

The results of the most recent round of stock assessments for overfished species were, in general, more optimistic than the prior round of assessments. The exception to this is yelloweye rockfish, which was substantially more pessimistic. As a result of the need to restrict the fisheries based on the new yelloweye assessment, the GMT recommends the OY ramp-down strategy for this species, which results in a lower OY, but would provide time to collect much-needed additional data that could better inform new management measures for greater yelloweye protection.

Cowcod may be viewed as an unproductive stock, similar to yelloweye; however the most recent round of assessments shows this stock is less depleted than previously thought. Because of the more optimistic stock assessment result, a dramatic decrease in the OY may not be necessary like the proposed decrease in the yelloweye OY. The GMT feels that the relatively unproductive nature of these stocks justifies a relatively restrictive management scheme.

Canary rockfish and bocaccio may be viewed as being more productive than yelloweye and cowcod, but less productive than Pacific ocean perch, darkblotched rockfish, and widow rockfish. The GMT recommends adopting OYs for these species that are relatively close to pre-season catch predictions because of the greater depletion and lower productivity of these stocks. While setting an OY close to predicted catch is expected to result in substantial inseason actions to stay within those OYs (because of inseason deviations from pre-season catch predictions), the GMT feels that the productivity of these stocks justifies a relatively more restrictive management scheme.

Pacific ocean perch, darkblotched rockfish, and widow rockfish may be viewed as being less depleted and more productive than the other three depleted species. If the Council wishes to accommodate the GMT's request to allow for uncertainty and management flexibility by building in a difference between the OY and predicted catch, the GMT feels that this difference or "buffer" should be greatest around these species. Doing so would have a relatively small impact on the rebuilding times for these species, but would accommodate management flexibility, reduce the need for inseason adjustments to management, and result in greater stability to the management regime. The GMT would also like to note that when a buffer is set between the expected (scorecard) catch and the adopted OY, the benefits realized in more rapid rebuilding times when actual catches are less than the OY are captured in subsequent stock assessments and assessment updates (as realized catches, rather than OYs, are entered into subsequent assessments as data).

As discussed above, the Council sets harvest levels and management measures pre-season with the expectation that the management measures will adequately constrain harvest to keep total catch within established harvest levels. As each season progresses, new information becomes available, often modifying the assumptions that were made pre-season about catch and bycatch rates. When inseason catch rate estimates vary from pre-season catch rate estimates, the Council takes inseason action to either constrain the fishery to stay within OYs, or liberalize the fishery to achieve OYs for non-overfished species while staying with overfished species OYs. Inseason revisions to management measures are necessary to maintain rebuilding schedules and to prevent overfishing, but the more inseason measures vary from those set pre-season, the less predictable fishing business management becomes for fishery participants.

Species That Are Most Sensitive to Changes in OY

Cowcod While the cowcod stock assessment is data poor, the GMT believes that continued use of closed areas as a management tool would appropriately keeps the catches of cowcod to an acceptable level. The GMT notes that all of the Action Alternatives, including the No Action Alternative, would result in projected cowcod mortalities that are less than the Preferred High OY (by 0.8-4.7 mt). The 8.0 mt Preferred High OY for cowcod is calculated under an 80% probability of rebuilding by T_{MAX}, or a rebuilt date of 2043. Projecting the status quo harvest rate forward would result in an OY of 4.6 for 2007 and 2008, with a rebuilt date of 2040.

Yelloweye Yelloweye rockfish have a life history that illustrates the classic challenge of rebuilding overfished West Coast rockfish stocks – they are slow to mature, have low productivity, and can live in excess of 100 years. Given their low productivity, any incremental change in yelloweye rockfish harvest *levels* can notably change the associated constant harvest *rates*. For example, a 2007 OY of 12 mt would result in a constant harvest rate that would extend the rebuilding period beyond the F=0 rebuilt date by 30 years (from 2048 to 2078), while a 2007 OY of 12.6 mt would result in a constant harvest rate that would extend the rebuilding period beyond the F=0 by 35 years (from 2048 to 2083).

For yelloweye rockfish, the GMT recommends a departure from the Council's practice with other overfished species of setting constant harvest rates that are intended to carry through time to the rebuilt dates. We recommend that yelloweye OYs in 2007-2010 be set at ramping down harvest *levels*, beginning with 23 mt in 2007 and continuing to 20 mt in 2008, ultimately reaching 13.5 mt in 2011. Beginning in 2011, the yelloweye rockfish rebuilding plan would revert to a constant harvest rate of F = 0.0101 through to the rebuilt date of 2083.5. By contrast, an initial 2007 OY based on this harvest rate would result in an OY of 12.6 mt and a rebuilt date of 2083. As points of reference, the 2006 yelloweye OY is 27 mt, with expected total catch currently estimated at 21.1 mt.

By any standards, the yelloweye assessment data are sparse; the assessment is tuned to recreational catch-per-unit-of-effort (CPUE) data with a decreasing period of coverage from south to north, and size and age composition information and fishery independent data are particularly lacking. Additionally, yelloweye rockfish have a low vulnerability to trawl gear (which is why the NMFS trawl survey is a poor index for this stock), and WCGOP data for fixed gear fisheries is minimal. Poor yelloweye rockfish data availability makes provision of a yelloweye research catch allowance critical to future assessment, management and rebuilding efforts. Therefore, the GMT continues to support the ramp-down approach for yelloweye. This approach would provide time for: 1) additional data to be collected through additional and/or enhanced research, such as the International Pacific Halibut Commission survey; 2) fishermen, such as fixed gear fishery participants, and processors who will be affected by the yelloweye rebuilding plan to make decisions that could affect their future businesses; and 3) the Council, its advisory bodies, and the states to identify, explore, and further develop management tools to manage to the lower rebuilding OYs that are anticipated over the next few years.

Yelloweye rockfish are sedentary in nature and tend to favor the high rocky relief, or untrawlable habitat, found off the northern West Coast. Due to their habitat preference, yelloweye rockfish are rarely encountered in trawl fisheries, especially in light of small footrope requirements on the shelf. Most yelloweye harvest occurs in tribal and non-tribal hook and line fisheries, and in recreational fisheries. However, some of the specific rocky relief areas are prime recreational halibut and lingcod fishing areas, while other areas encompass favorite commercial fishing spots. Logbook data, or data on fishing locations by these different fisheries is, for the most part, not collected, and at-sea observations are minimal. Therefore, the states would like to have a series of public meetings with affected stakeholders to develop potential area closures for yelloweye rockfish conservation, which could be in place beginning in 2009, and design and implement a logbook program for fixed gear fisheries. Additionally, further research to examine survivability and recreational gear selectivity may provide information to help design management measures for the 2009-2010 management cycle.

Given the high degree of uncertainty in the assessment, the GMT developed alternatives that target amounts less than the Preferred High OY. For example, the estimated mortalities for Action Alternatives 2 and 3 are 14.3 mt and 18.3 mt, respectively, compared to an initial ramp-down OY of 23 mt, which leaves residual amounts of 4.7-8.7 mt in 2007, and 1.7-5.7 mt in 2008.

Species That Are Moderately Sensitive to Changes in OY

<u>Bocaccio</u> The bocaccio stock assessment demonstrates that recruitment is highly variable and anecdotal evidence suggests there may be a strong incoming year-class. Should this strong year-class become evident, past experience indicates that young bocaccio are difficult to avoid for most fisheries and, consequently, encounter rates would be expected to increase. Additionally, the commercial trawl preseason catch projections for bocaccio have been off by a significant amount (100-200%) as compared to post-season catch estimates in recent years, and fixed gear West Coast Groundfish Observer Program (WCGOP) data, especially for the area south of 40°10'N. lat., is fairly sparse. Therefore, we recommend that the Council consider management measures that would result in preseason catch projections that are significantly less (e.g., around 15-20 mt) than the OY to cover this uncertainty. The GMT notes that Action Alternatives 2 and 3, and the No Action Alternative would result in projected bocaccio mortalities that are significantly less, by 32-107 mt, than the Council's Preferred High OY of 218 mt.

<u>Canary</u> Unavoidable incidental catches of canary rockfish occur in trawl, fixed gear, open access, and recreational fisheries targeting groundfish, as well as commercial and recreational fisheries targeting species other than groundfish. Canary's wide geographic distribution and catchability in all fisheries makes it difficult to manage with species-specific RCAs, like yelloweye rockfish and cowcod. Canary is one of the most constraining stocks in 2007-2008 management. The commercial trawl preseason catch projections have been off by a factor of 75-100% as compared to post-season catch estimates in recent years. WCGOP data for fixed gear is fairly sparse, and there is very little observer data for open access and recreational fisheries. Therefore, the GMT recommends the Council consider management measures that would result in preseason catch projections that are slightly less than the Preferred High OY. All of the Action Alternatives, including the No Action Alternative, would result in projected canary mortalities that are less than the Preferred High OY (by 2.7-10.9 mt).

Species With OYs Affected by the Rebuilding Paradox

Darkblotched In the recent past, the commercial trawl preseason catch projections for darkblotched rockfish have been off by as much as 250% as compared to post-season catch estimates. Darkblotched is rarely caught by fixed gear and recreational fisheries. While the GMT has significantly increased the precision in its catch estimation methodology over the past year, inseason data indicates that actual catches are still about 50% higher than what was projected preseason for 2006. Additionally, this species is nearing its rebuilt level, with particularly strong year classes from 1999 and 2000 that are now entering the fishery. Between 2000 and 2005, both the biomass and the spawning output of darkblotched roughly doubled. The biomass is expected to increase by an additional 40% from current levels by 2010, with spawning output doubling again in that period, at which point the stock is expected to be rebuilt based on the assessment point estimate.

This rapid darkblotched stock increase means that there would likely be increased encounter rates for darkblotched in 2007 and 2008 (i.e., the "rebuilding paradox" of not being able to avoid higher catches as the stock approaches target biomass levels.) Therefore, the GMT recommends the Council consider including a relatively high amount of OY to cover this rebuilding paradox and continued catch projection modeling uncertainty. The GMT notes that, while the Action Alternatives, including the No Action Alternative, all result in projected darkblotched mortalities that are less than the Preferred High OY (by 18.2-32.5 mt,) the amount of residual may not be sufficient to address the high variability in encounter rates as the stock rebuilds. As a potential consequence of variable encounter rates, darkblotched bycatch may jeopardize commercial slope fisheries such as the DTS and winter petrale fisheries. The Council has repeatedly heard testimony from industry on the importance of winter petrale and DTS fisheries in maintaining a permanent work force, and avoiding loss of markets to other supply sources which, once lost, can be difficult to regain.

Pacific ocean perch The commercial trawl preseason catch projections for Pacific ocean perch (POP) have been off by as much as 100% as compared to post-season catch estimates in recent years; however, the GMT has significantly increased the precision in its catch estimation methodology over the past year, especially for trawl. Like darkblotched, POP is rarely caught by fixed gear and recreational fisheries. However, POP is also nearing its rebuilt level, so there would likely be increased encounter rates for POP in 2007 and 2008. Therefore, the Council may wish to consider including a relatively high amount of OY to cover the rebuilding paradox and this uncertainty. Similar to darkblotched, unless there is sufficient OY available to address these items, POP will likely constrain commercial slope fisheries. However, unlike darkblotched and other overfished stocks, there is expected to be hardly any residual for POP (i.e., no residual for Action Alternatives 1 and 3, and a residual of 1.5 mt in Action Alternative 2). This is because the OYs analyzed for the Action Alternatives for POP for 2007 and 2008 (which are 44 mt and 100 mt) are significantly reduced from the 2006 OY level of 447 mt. These reduced OYs were not the result of the recent stock assessment or rebuilding plan, but were proposed from recent catch levels in the commercial slope fisheries, which are more significantly constrained by darkblotched rebuilding levels.

Widow Rockfish For widow, the commercial trawl preseason catch projections have been off by as much as 100% as compared to post-season catch estimates in recent years; however, the GMT has significantly increased the precision in its catch estimation methodology over the past year, especially for trawl, and catches of widow are small in fixed gear and recreational fisheries. However, widow is also nearing its rebuilt level, so there would likely be increased encounter rates for widow in 2007 and 2008. Therefore, the GMT recommends the Council consider management measures, which would result in preseason catch projections that are slightly less than the Preferred High OY. Action Alternatives 2 and 3, would result in projected widow rockfish mortalities that are significantly less than the Preferred High OY (by 176-224 mt); however, Action Alternative 1 with the low OY for widow has little residual (3.8 mt) remaining.

Harvest Guidelines for Canary and Yelloweye Rockfish

The Council needs to set separate harvest guidelines for canary and yelloweye rockfish for the recreational fisheries, to be divided at the Oregon/ California border. Under status quo management the Council had adopted harvest guidelines for canary and yelloweye recreational fisheries. The 2006 scorecard represents these harvest guidelines; the 2005 scorecard reflects the end-of-season fishery impacts that actually occurred. Following Council guidance at its April 2006 meeting, the GMT constructed scorecards representing different allocation scenarios (Tables 4-43 through 4-47 in Agenda Item F.2.a Attachment 2, pages 133-140). The recreational fishery harvest guideline alternatives in the table below are taken from those scorecards. These harvest guidelines represent proportional reductions from the 2005 or the 2006 scorecard in order to constrain total mortality below the Preferred Low or the High OY alternatives. One scenario depicts the harvest guidelines if all of the canary and yelloweye rockfish were allocated to the recreational fisheries.

Canary Rockfish recreational harvest guideline/ target alternatives

			High OY		Low OY			
	2006 scorecard		Using 2006 scorecard	Using 2005 scorecard	Using 2006 scorecard	Using 2005 scorecard	All Rec, w/ 2006 scorecard	All Rec, w/ 2005 scorecard
WA	8.5		1.6	1.4	1.1	1.6	2.1	4.7
OR			6.6	5.4	4.3	4.1	8.3	12.1
CA	9.3		9	2	5.9	1.7	11.4	5

Source: Tables 4-43 to 4-47 in Agenda Item F.2.a Attachment 2, pages 133-140

Yelloweye Rockfish recreational harvest guideline/ target alternatives

			High OY				Low OY			
	2006 scorecard		Using 2006 scorecard		Using 2005 Scorecard		Using 2006 Scorecard	Using 2005 Scorecard	All Rec, w/ 2006 scorecard	All Rec, w/ 2005 scorecard
			2007	2008	2007	2008	2007-8	2007-8	2007-8	2007-8
WA	6.7		3.5	3	5.4	4.4	1.6	2.4	2.6	3.9
OR			3.2	2.7	4.2	3.5	1.5	1.9	2.3	3.1
CA	3.7		3.7	3.1	0.9	0.8	1.7	0.4	2.7	0.7

Source: Tables 4-43 to 4-47 in Agenda Item F.2.a Attachment 2, pages 133-140

** Note that Table 4-61 (p. 154 in F.2.a Attachment 2) gave the California recreational 2006 harvest guidelines, rather than the no action impact estimates. The no action impact estimates should be 6.1 mt for canary rockfish and 1.5 mt for yelloweye rockfish. The no action impact estimates are correctly listed for the other states in Tables 4-59 and 4-60.

HABITAT COMMITTEE REPORT ON TENTATIVE ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

John Field of the Groundfish Management Team briefed the Habitat Committee (HC) on the potential opening of parts of the California Cowcod Conservation Area (CCA) to certain gears. The HC had concerns that the parts of the CCA that may be opened contain black corals, which are highly sensitive to disturbance.

A portion of the CCA (CCA East) has already been identified in the Groundfish Essential Fish Habitat Environmental Impact Statement as an ecologically important area. However, new information described in the groundfish annual specifications for 2007-2008 (Tissot et al. 2006) notes that high concentrations of newly described species of black corals are found in both the Potato Bank and Santa Barbara Island areas. Information is sparse regarding the associations of groundfish with habitat-forming invertebrates and coral. However, given the vulnerability of this habitat and the limited coverage of the Tissot survey, we urge the Council to maintain the status quo. At a minimum, we urge the Council to consider an option that would leave closed the high-density coral areas described in the paper.

Modifying the CCA demonstrates the complexities involved in multi-species management; taking one action, such as opening these areas, would affect a number of rockfish and other species. Maintaining a stable CCA provides an opportunity to develop an ecosystem management approach over time, although this was not the original purpose for creating the CCA.

PFMC
6/13/06

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON TENTATIVE ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

Mr. John DeVore met with the Scientific and Statistical Committee (SSC), and provided an overview of important issues contained in the reference documents under this agenda item. Most of the analytical methods and technical issues associated with the impacts analyses presented in these documents have previously been reviewed by the SSC. Therefore, SSC discussion of the documents focused on a few topics under consideration for 2007 which were either newly developed, required further clarification, or have become of higher importance than in past years.

The SSC notes that among the management proposals in Draft Amendment 16-4 (Agenda Item F.2a, Attachment 3), there is an option on page 27 where "…the Council may establish a research reserve for any stock, that is within the ABC but above and separate from the OY for that stock." If adopted, this would represent a significant change from the way that mortality associated with research activities has been previously accounted for in groundfish management. Potential advantages to this approach are that the fishery would not be subject to early closure due to unexpectedly high research catches, and research could continue unhindered under most situations, thus providing crucial information that is not otherwise available when stocks are under rebuilding constraints. Total catch accounting means that the catch series used for assessment and rebuilding analyses includes research catches.

The evaluation of action alternatives for cowcod (Agenda Item F.2a, Attachment 3, pages 72-73) raises the issue that modifying the current Cowcod Conservation Area (CCA) boundaries could undermine the ability to replicate the recent submersible survey within the CCA. The SSC notes that the methodology used in conjunction with the previous survey to extrapolate the findings over other habitats outside the CCA would not be appropriate for future surveys, and therefore CCA management consistency would not be an issue with respect to future survey work. Of greater importance is that fishing mortality is no longer distributed across all areas, and hence future surveys should be conducted both inside and outside the CCAs, so that the abundance extrapolations may be stratified accordingly. While there may be good reasons to consider not changing the CCA boundaries, possible impacts to future survey work is not one of them.

The economic impact analyses take into consideration current economic effects, but not how these effects may change through time. For example, it is not clear how an economic sacrifice today may be mitigated by increased revenue due to higher abundances at a future date, or how loss of current fishing opportunities may result in loss of port infrastructure that reduces future fishing opportunities. A dynamic benefit-cost analysis would help inform the Council on these trade-offs. However, such an analysis would need to project forward for all fisheries and sectors impacted by overfished species, which would be a complex undertaking.

PFMC
06/13/06

Notes from SSC to John DeVore:

Clarifications and recommendations for reference documents

- *The analyses that report time to rebuild in fractional years imply greater precision than is appropriate. Round rebuilding times to nearest whole year.*
- *Care should be taken to not make value judgments in the analyses. For example, the risk associated with canary rebuilding is not much different among alternatives, and therefore the expected duration of rebuilding should be highlighted among alternatives, rather than risk of not rebuilding.*
- *It would be useful to present the difference in rebuilding times in both absolute years and as percent change. For example, a hypothetical one year increase is negligible if the rebuilding time is 70y, but it is a 50% increase if the rebuilding time is 2Y.*
- *Table 1 in Supplemental Report 5 should be appended to include community impacts.*
- *In Draft Amendment 16-4, it should be clarified that the year that a stock is expected to be rebuilt is not an absolute. Statements such as "the year in which the stock would be rebuilt…(page 39)" should be revised to convey less certainty.*
- *It would be desirable to clarify the notion of a stock. In particular, for a situation such as lingcod where it has a continuous latitudinal distribution but clear geographic differences in progress toward rebuilding, it may be appropriate to have an established mechanism or process to identify a "unit to conserve" that is smaller than the overall stock.*

WESTPORT CHARTERBOAT ASSOCIATION
P. O. BOX 654 • WESTPORT, WASHINGTON 98595

May 12, 2006

Pacific Fishery Management Council
Chairman Don Hansen
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

RECEIVED
MAY 17 2006
PFMC

Re: 2007-2008 Groundfish management

Dear Chairman Hansen;

The Westport Charterboat Association would like to go on record in support of the "phase-in" approach to the rebuilding OY for Yelloweye Rockfish.

Over the past six years our fleet in Westport has reduced it's YE mortality from around 1,400 per year in 1999 to less than 200 in 2005. That's an 85% reduction. This has been accomplished through both regulation and avoidance of areas that are prone to YE encounters. Although further reductions are possible, the social and economic cost becomes quite large. We would lose access to the more abundant species that our livelihoods depend upon.

We understand that a phase in approach would result in a slightly longer rebuilding time. The delay involved in a phase-in gives us precious time to generate more data and even more effective management measures. We are also concerned with a management process that considers Yelloweye coast-wide. Yelloweye are sedentary and live in specific areas virtually all their lives. Although they may be the same critter genetically, they don't migrate up and down the Coast. It makes all the sense in the world to manage these fish regionally. That would go a long way toward reducing localized depletion.

We have always worked in a proactive fashion regarding conservation of Rockfish species. The history of our reduction of impacts on this species speaks for itself and we ask that you adopt a phased-in approach to Yelloweye management to give time for the acquisition of better data and the development of a more appropriate management philosophy.

Thank you for your consideration,

Steve Westrick, President
Westport Charterboat Association

Subject: Grounded Fish
From: "Seiber, Christopher L" <Christopher.L.Seiber@boeing.com>
Date: Wed, 26 Apr 2006 12:53:52 -0700
To: <fishpgm@dfw.wa.gov>, <John.DeVore@noaa.gov>

What a waste...
Recreational fisherman are 'harvesting' over 9 metric tons of canary and yellow eye? You're numbers were based on 100% mortality. Even at 66% don't you think you're off the mark? Don't bother answering that. Quit wasting the fish while you can't make a decision to stay away from them. Set a better guideline, a scientifically realistic one. Then keep the incidentally caught fish until the guideline is met then close the area. I've seen the fish returned and not floating after properly deflating the bladder. Address the real issue - COMMERCIAL HARVEST!!!!!   HELLO!!! U.S. and International.
We're getting tired of getting, or not getting what's left over after the state gets done with the commercial harvest interests...

Chris Seiber

18 May 2006
John DeVore
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

RECEIVED
MAY 2 3 2006
PFMC

RE: Cow Cod Conservation Area

Mr. John Devore and all Council members,

I would like to provide some new information and clarify a few points I made earlier for the Council members, concerning the possible reconfiguration of the outer boundary of the CCA. I would appreciate these remarks finding their way to the Council briefing book in time for the June meeting.

First off, this issue would not be a subject for discussion had the Point Conception Groundfishermen's Association not gone to the May, 2005 CA Fish and Game Commission in Sacramento. After three years of our members writing numerous letters and making multiple telephone calls to our State representatives regarding the onerous nature and burden the CCA presents to fishermen; the Commission had to direct their Department to get "off their asses" and address this. Fishermen had previously been ignored.

The Council needs to clearly understand the facts of this issue so they can make a decision based on the ***best science available*** and ***their responsibility*** to fishermen under the Regulatory Flexibility Act.

This is not a dispute over the health of cow cod stocks. They may or may not be over fished, but without question the data shows their abundance is increasing exponentially faster than past projections. ***This is*** a dispute about the areas ***closed*** to ***protect*** cow cod.

The West Coast Ground fish Observer program was implemented and touted as a critical tool to get factual information, good or bad for our various ground fisheries. One particularly interesting statistic discovered from this program is that for **6,285 observed sets**, south of 40°10′, between August 2001 and April 2006 for fixed gear deeper than 150 fathoms, there was a total of ***zero*** cow cod taken. Please refer to the enclosed letter from Janell Majewski, WCGOP Lead Debriefer and

Trainer. If no cow cod are being taken, why is 70% of the CCA in depths greater than 150 fathoms?

What the affected fishermen in Southern California are proposing is that the present outer boundary for the CCA be changed to replicate the 175-fathom curve instead of the existing straight line, big block approach that encompasses depths as great as 1000 fathoms. Special conditions that ***only vessels with VMS*** are allowed inside the existing CCA with ground fish aboard. Though the data clearly shows no interaction with cow cod to as shallow as 150 fathoms (the outer boundary of the RCA's in so. Ca.) The fishermen proposed 175 fathoms, leaving a 25-fathom buffer zone.

At this point, it seems the biggest obstacle to this proposal has been the unwillingness of the 'enforcement consultants' to consider at even the smallest level, the benefits this action would have for the fishermen versus their fears of some massive assault on their ability to enforce the proposed CCA boundaries. Lets put the facts out on the table. First of all, the boats fishing in the CCA areas would have VMS. Enforcements arguments about VMS not being adequate because of the lack of data sharing, or the Feds being incompetent just don't hold water. Please take a look at enclosed article from the Chinook Observer, a recent example of the effectiveness of VMS. Furthermore, our proposal has a VMS zone miles from the 175-fathom curve for the entire CCA. Please refer to enclosed chart. We are talking about a very small fleet, a total of nine vessels. The State enforcement personnel have a wide range of tools besides VMS at their disposal. Wouldn't it be great to hear what the Department ***can do*** rather than their persistent whimpering about what they cannot do?

It is time somebody stands up for the fishermen whose livelihoods have been so negatively impacted by this over reaching and unnecessary closure. Please support changing the outer boundary of the ***entire*** CCA to 175-fathoms.

Sincerely,

T. Athens

Tim Athens

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Northwest Fisheries Science Center
2725 Montlake Boulevard East
Seattle, WA 98112

May 2, 2006

Mr. Tim Athens
Neptuneabs@aol.com

Hello Mr. Athens,

In April of 2006, you requested information on observed cowcod rockfish catch by fixed gear fishers outside of 150 fathoms and South of Point Conception from the West Coast Groundfish Observer Program. We were able to process this request with one modification.

Currently, the program only stratifies data geographically by North and South of 40°10′N latitude. Therefore, this is the stratification used for your data request.

Results: In the 6,285 observed sets, there have been zero occurrences of cowcod rockfish in the limited entry and open access fixed gear fisheries outside of 150 fathoms, South of 40°10′N Latitude, between August 2001 and April 2006.

As you can see from the results, the modification of your request has no bearing on the outcome.

Thank you for patience in filling this data request. If you have any questions, please don't hesitate to contact me at (206) 860-3293.

Sincerely,

Digitally signed by Janell Majewski

Janell Majewski
WCGOP Lead Debriefer/Trainer

cc:
Elizabeth Clarke
Jonathan Cusick
Frank Lockhart
Yvonne Dereynier

"The Observer has come to stay, and it won't take water from anything that wiggles."
— George Hibbert
Observer Founding Editor
Dec. 28, 1900

CHINOOK OBSERVER
The News Source for Washington's Long Beach Peninsula since 1900

Wednesday, May 10, 2006

Fisheries bust details found in court documents

Ken Greenfield Jr. allegedly violated laws protecting Pacific ground fish

By NANCY BUTTERFIELD
Observer correspondent

Wednesday, May 10, 2006

CHINOOK — When about 50 state and federal law enforcement officers descended on the Port of Chinook the morning of April 25, they not only arrested suspected illegal immigrants, they also served a search warrant on three fishing vessels at the port, at the Garda Marie Seafood Co. in Chinook and at the Bell Buoy Crab Co. fish-processing plant.

In an application and affidavit for a search warrant filed by Michael Adkins in U.S. District Court in Seattle by the National Oceanic and Atmospheric Administration/National Marine Fisheries Service Office of Law Enforcement dated April 20 and signed by U.S. Magistrate Judge Karen L. Strombom, agents found probable cause of violations of the Lacey Act by the fishing vessels Garda Marie, Renee Maria and Rememberance, the home office of Garda Marie Seafoods and the Bell Buoy processing facility.

Adkins is a special agent with the U.S. Department of Commerce, NOAA and NMFS OLE and is charged with enforcing fish and wildlife laws.

The Lacey Act is a federal statute which prohibits the sale, trade or transportation of wildlife or wildlife products harvested or attained in violation of federal, state, tribal or foreign laws.

The investigation into the fishing practices by the owner of two vessels at the Port of Chinook marina, Kenneth Greenfield Jr., and by Bell Buoy Crab Co. began in September last year. The search warrant was issued to search the three fishing vessels at the Port of Chinook marina, the home office of the owner-operator of the Garda Marie and the Renee Maria, Greenfield, and Bell Buoy, for alleged preparation and submission of false documents related to unlawfully taken sablefish, also known as black cod.

According to the warrant, he investigation centered on fishers operating out of the Chinook marina.and selling catches to Bell Buoy Crab Co. Sablefish, and more than 80 other species, are managed under the Pacific Coast Groundfish Fishery Management Plan.

Regulations require fish receiving faciliities to complete a "fish receiving ticket" immediately upon receipt of federally regulated groundfish from commercial fishers. A copy of the ticket must be given to the commercial fisher at the time of purchase or delivery and a copy must be retained by the dealer. Tickets must be signed under penalty of perjury as being accurate by the dealer and the fisher. Federal and state regulations prohibit the falsification of, or failure to make or file, tickets for groundfish species managed by PCGFMP.

A confidential informant contacted a Washington Department of Fish and Wildlife enforcement officer, according to the warrant, saying that the operator of a commercial fishing vessel operating out of Port of Chinook was exceeding the weekly trip limit — Kenneth Greenfield Jr, operating FV Garda Marie, who had allocated a portion of the catch to the Renee Maria. That vessel allegedly hadn't left the marina on the day in question.

Investigators also looked into additional discrepancies related to the fishing activity last August of Robert T. Greenfield, Kenneth Greenfield's brother, operator of the FV Rememberance, also at Chinook marina, a limited entry vessel, who allegedly recorded catching 884 pounds of black cod on the FV Rememberance, which allegedly didn't leave the port that day.

The informant said Greenfield had allegedly engaged in similar conduct on several occasions throughout the 2005 sablefish season, according to the affidavit.

Adkins said in the affidavit he believed that Bell Buoy was submitting falsified tickets in an apparent effort to under-report sablefish catches.

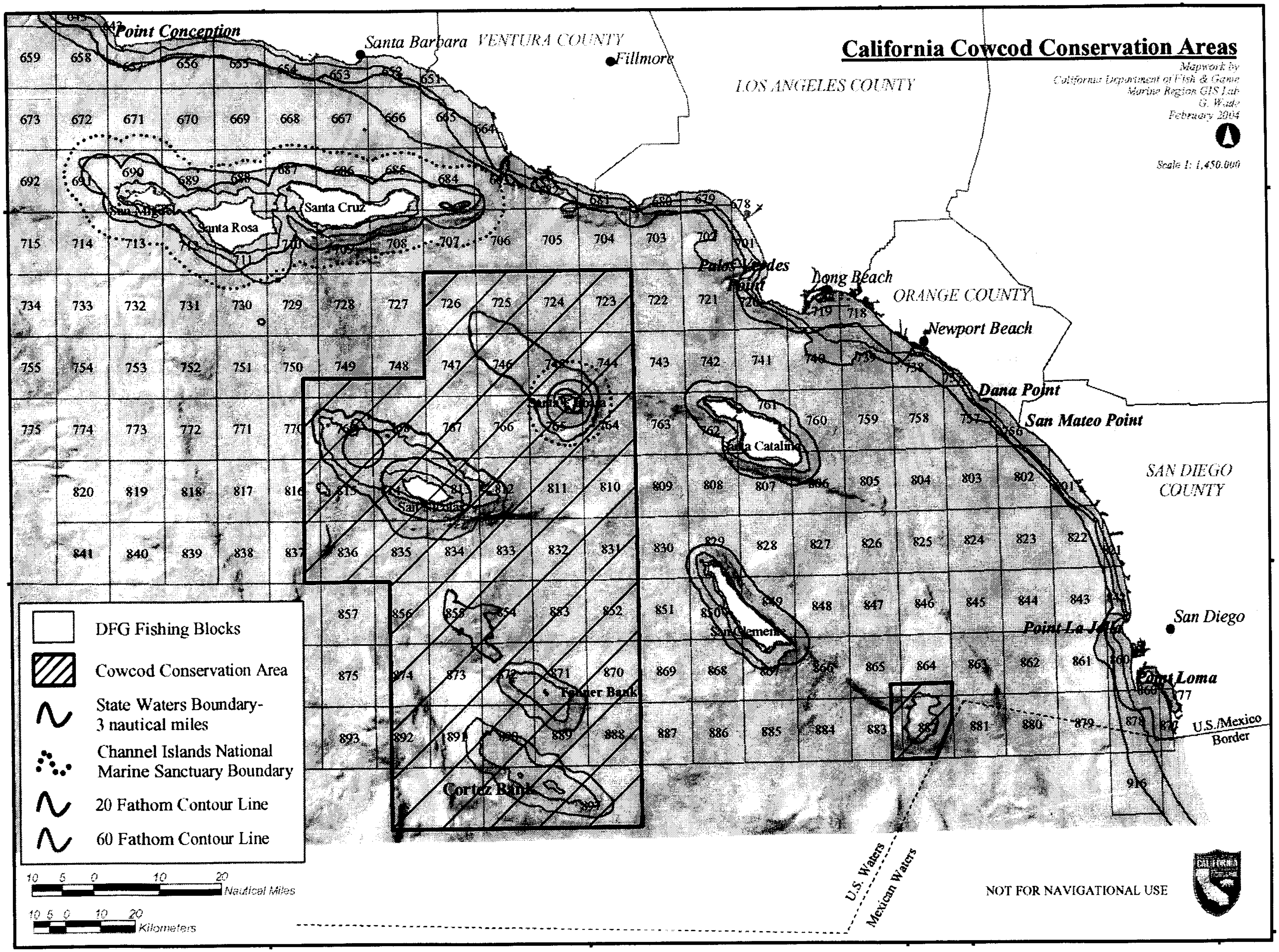
In November 2005, Adkins said he determined "that Bell Buoy had submitted 17 tickets on which trip limits for sablefish were exceeded [and] none of the overages had been reported to state or federal officials." He said a review of tickets submitted by Bell Buoy "disclosed additional discrepancies related to the fishing activity of Robert Greenfield."

"A ticket dated Aug. 20, 2005, reported that Bell Buoy purchased 884.8 pounds of sablefish from Robert Greenfield off the R/V Remembrance. My review of the Vessel Monitoring System data recorded on Friday, Aug. 19 and Saturday, Aug. 20, indicates that the Rememerance did not leave the marina on either date."

Investigators interviewed numerous people involved at the Port of Chinook and at Bell Buoy about how sablefish catches were being reported at Bell Buoy. The investigation caused a NOAA/NMFS officer to believe "Bell Buoy was submitting falsified tickets in an apparent attempt to underreport sablefish catches. Underreporting allows vessel operators to overfish and then provides Bell Buoy with more fish to process and sell," according to the affidavit..

Additional discrepancies listed in the affidavit related to the fishing activity of Robert T. Greenfield, operator of the FV Rememberance, also at Chinook marina, a limited entry vessel, recorded 884 pounds of fish from the Rememberance, which allegedly didn't leave the port that day in August.

An agent interviewed Robert Greenfield, who said he was sport fishing for salmon on that day and that the records must be wrong. But, according to the affidavit, his signature was on the ticket.



~ - 175 Fathom Curve

May 24, 2006

RE: Modify Cowcod Conservation Area

Dear Council Members,

I am writing to support the proposal to modify the Cowcod Conservation Area (CCA) boundaries. This proposal is contained within your upcoming groundfish regulation package. The proposal will modify the CCA to allow fishing in depths greater than 175 fathoms. This modification is an adaptive management action that will provide access to abundant fish stocks that are currently lock up inside the CCA without harming over fished species or their recovery efforts. This action is constant with the PFMC's Strategic Groundfish Plan and will provide need economic relief to our local groundfish fishery and fishing infrastructure.

The decision to modify the CCA to depth shallower than 175f is based on two factors:

1) Biological considerations
2) Enforcement considerations

I request that you ask the following question before you vote on this important action:

Factor 1) Biological considerations:

Question 1. Is there any biological harm to current rebuilding programs or overfished stock that this change would cause?

Question 2. Do we have observer data to support a decision to allow fishing below 175f?

The PFMC Groundfish Fishery Strategic Plan states: *"(b) Strategic Plan Goal for Observer Program"*
"To quantify the amount and species of fish caught by the various gears in the groundfish fishery and account for the total fishery related removals"

The observer program has generated the information required to answer questions relating to factor 1)'Biological Considerations'. Answer-NO HARM

Factor 2) Enforcement Considerations

Question 3.How can we balance enforcement simplification with the economic viability of the fishery?

The strategic plan provides some insight into balancing competing goals. Adaptive management is a high priority goal. VMS and the observer program provide important tools to achieving adaptive management that did not exist when the CCA was originally created.

The PFMC Groundfish strategic Plan states under 'COUNCIL PROCESS AND EFFECTIVE PUBLIC INVOLVEMENT'
(b) STRATEGIC PLAN GOALS for COUNCIL PROCESS:
A. *To establish and maintain a management process that is transparent, participatory, understandable, accessible, consistent, effective credible, and* ***adaptive:***

B. *To provide a public forum that can respond in a timely way to the* ***needs of the*** *resource and the* ***communities*** *and individuals* ***who depend on them****: and*

C. *To establish a long-term view with clear, measurable goals and objectives.*

Question 4. Why has the PFMC adopted the VMS program if it is not intended as in enforcement and monitoring tool to allow this type of adaptive change?

Question 5. How is enforcement able to enforce a depth based modified Rockfish Conservation Area (RCA) North of 40.10. N. lat.for Limited entry Trawl Gear (NMFS-SEA-06-03) but not a depth based modified CCA area for Limited entry Fixed Gear?

Question 6. How is enforcement able to enforce three different depth definitions of the RCA South of 40. 10. N lat. (75fm-150fm along mainland coast, 150fm around islands in JAN and Feb, 100fm-150fm Mar-OCT and 75fm-150fm in Nov-Dec, if they are unable to enforce a 175-depth definition of the CCA?

Question 7. Why didn't the enforcement wing of the CDFG object to enforcing 40 individual boundary lines for the 12 marine reserves and MPA at the Channel Islands, if enforcing changes to the CCA is so difficult?

Question 8. Is enforcement using, "enforceability" of the CCA modification, as a tool to mask a DFG policy preference to retain the current CCA boundaries?

Please use adaptive management and provide us with needed regulatory relief.

Sincerely,

Chris Hoeflinger,
Fishery Representative, Channel Island National Marine Sanctuary, Sanctuary Advisory Council

NRDC
THE EARTH'S BEST DEFENSE

May 24, 2006

BY FAX (503-820-2299), EMAIL (pfmc.comments@noaa.gov), AND U.S. MAIL

John DeVore
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

Re: Draft Amendment 16-4 and 2007-2008 specifications and management measures for the Pacific groundfish fishery

Dear Mr. DeVore:

We are writing on behalf of the Natural Resources Defense Council (NRDC) and NRDC's more than 550,000 members to comment on the draft plans for Amendment 16-4 and the 2007-2008 specifications and management measures (specifications) for the Pacific groundfish fishery. Please include these comments in the June 2006 briefing book.

Overview

We have reviewed the Council's draft proposals from the April briefing book for new rebuilding plans and for the 2007-2008 specifications. We are encouraged by the apparent improvements in the biological condition of a number of the overfished species, and hopeful that the Council will develop a rebuilding approach that applies the shortest time period possible. However, such an approach is not yet clearly in evidence. We are concerned that the Council may use the more optimistic stock assessment results to increase short-term catch levels instead of reducing rebuilding time periods. We also remain concerned that some species (e.g. canary and bocaccio) are still at extremely low levels—in the range of 10% of historic biomass. Although some of the rebuilding alternatives being considered appear to include satisfactorily short rebuilding periods in light of the recent Ninth Circuit decision, NRDC v. NMFS, 421 F.3d 872 (9th Cir. 2005), the fact remains that many of the alternatives do not. Additionally, the proposed plans continue to be based on some of the same fundamentally flawed methodologies as the existing plans, as well as some new ones.

Rebuilding Alternatives

Based on the information available in the April 2006 Briefing Book, many of the proposed rebuilding plan and Optimum Yield (OY) alternatives repeat the problems of the existing plans. Despite ample language to the contrary, the new rebuilding plan alternatives currently under consideration provide no assurances that rebuilding periods will be "as short as possible" or mortality levels as low as possible. Indeed, many of the proposals continue to delay rebuilding beyond what the law requires, and do so by increasing mortality levels.

Rebuilding methodology

The Council acknowledges that NRDC v. NMFS "requires a reconsideration" of the existing rebuilding framework. PFMC, April Briefing Book, Agenda Item F.1.a, Attachment 2, at 5 (April 2006). The existing framework allows the Council to select any target rebuilding date (Ttarget) between the minimum time needed to rebuild in the absence of all fishing (Tmin), and Tmin plus one mean generation time (Tmax), even if that Ttarget is decades longer than Tmin. The Ninth Circuit held that the Magnuson Stevens Act's requirement to rebuild in a time period that is "as short as possible" "cannot be reconciled with a rebuilding period that is from 20 to 33 years longer than the biologically shortest possible rebuilding period...even granting the Agency some leeway in extending rebuilding periods" beyond Tmin. NRDC v. NMFS, 421 F.3d 872, 882 (9th Cir. 2005). Tmax, which is decades longer than Tmin for all of the overfished species, is an impermissibly long time period for rebuilding, and thus inherently illegal.

Nonetheless, many of the rebuilding alternatives being considered in the draft Amendment 16-4 either are pegged to and derived from Tmax, or would set Ttarget decades beyond Tmin, or both. For example, canary rockfish currently has a Ttarget of 2074, which is 17 years longer than the current Tmin. Under the new proposal and according to new stock assessment data, the new Tmin is moved from 2057 to 2048, but the three rebuilding alternatives being considered would establish new Ttargets that are 10, 15, and 23 years longer than the new Tmin, respectively. The longest of these alternatives actually sets Ttarget at Tmax, and so clearly would be illegal if adopted. These alternatives, and the methodology used to develop them, exemplify the potential gap between the Council's statements that the new rebuilding plans will comply with the Ninth Circuit's opinion and the reality of what is being proposed.

While the clear illegality of Tmax sets a definable outer bound for an illegally long rebuilding period, still at issue in the draft of Amendment 16-4 is how much "leeway in extending rebuilding periods" beyond Tmin the Council is allowed and how it must make that decision. The Ninth Circuit explained that the "leeway" was intended "to avoid disastrous short-term consequences for fishing communities." NRDC v. NMFS, 421 F.3d at 880. The Court provided the following example of disastrous consequences:

> "[E]ven if a fishing community is actively seeking not to fish for a certain species, it will inevitably catch some of the overfished species in the process of fishing for other, more plentiful fish-what is known as "bycatch." Because almost no groundfish that are caught as bycatch survive even if they are thrown back into the ocean, an absolute ban on catching any of a species of groundfish could mean *a total moratorium on all fishing in the parts of the fishery containing groundfish*, with obvious adverse consequences for fishing communities. Section 1854(e)(4)(i), then, allows the Agency to set limited quotas that would account for the short-term needs of fishing communities (for example, to allow for some fishing of plentiful species despite the inevitability of bycatch), even though this would mean that the rebuilding period would take longer than it would under a total fishing ban."

Id. (emphasis added). Thus, the court's example of "disastrous short-term consequences for fishing communities" is a total moratorium on all fishing due to an absolute ban on any bycatch of overfished species. NRDC is not suggesting that a complete moratorium on groundfishing is a feasible or desirable outcome.

The Council seems to be interpreting very broadly what economic "leeway" it is permitted to take in extending the lengths of rebuilding plans beyond Tmin. It is currently engaged in a detailed economic analysis that will consider and attempt to quantify the specific cost of different rebuilding periods on individual fishing communities. The analysis looks at two things: (1) what targeted species are caught from which ports, identifying whether the impacts of restricting bycatch on co-occurring overfished species would be High, Medium, or Low/No; and (2) the relationship between exvessel revenue and overfished species mortality. The Council is quantifying the specific economic effects of various mortality levels for overfished species (based on various rebuilding alternatives) but has yet to explain how the two are connected. There is no definable threshold (or even a discussion of the need for one) of what amount of economic impact – either by exvessel, by community, or both – would constitute "disastrous short-term consequences." Absent a threshold and any explanation of how the rebuilding alternatives relate to the economic analysis, the various rebuilding alternatives (and their associated mortality levels) cannot be assessed to determine whether they exceed the amount of economic "leeway" allowed by the Ninth Circuit's decision.

What is clear, however, is that the short-term economic needs of an individual fishing community do not constitute the broad type of "disastrous short-term economic consequences" described by the Court. Taking into account the short-term needs of fishing communities by providing some economic leeway in rebuilding times and mortality levels does not mean that the needs of a particular fishing community that is highly dependent on one or more overfished species can trump the requirement to rebuild as quickly as possible. The economic analysis must factor in the long and short-term economic needs of the entire fishery, and even then, cannot prioritize those needs over the clear priority given to conservation in the Magnuson-Stevens Act. We do not have enough information at this stage to know how the Council intends to use the new analysis. However, a potential use for the results of the analysis - to balance, or arguably prioritize, the needs of the fishing communities over the need to rebuild as soon as possible - conflicts with the Council's own interpretation of the Ninth Circuit's opinion currently contained in draft Amendment 16-4:

> "These actions must also conform to a recent court ruling in the Ninth Circuit Court of Appeals, which held that, among other things, *the purpose of the MSA is to give conservation of fisheries priority over short-term economic interests.* The Court interpreted the rebuilding requirements of the MSA as: 1) the rebuilding periods must be as short as possible; 2) short-term needs of fishing communities may be taken into account in setting rebuilding periods, even when the biology of the species dictates exceeding the 10-year statutory cap. As an example, the Court noted that in order to avoid disastrous short-term consequences, NMFS may set limited quotas that allow for some fishing of plentiful species, despite the inevitability of bycatch."

PFMC, April Briefing Book, Agenda Item F.1.a, Attachment 2, at 1 (April 2006) (emphasis added).

A fundamental question is how low bycatch levels of overfished species can be set without triggering disastrous short-term consequences. The Council has yet to directly address this question, although many of the rebuilding periods and associated mortality rates currently contained in the draft Amendment 16-4 alternatives are longer than what the current rebuilding plans allow and, at any rate, decades longer than Tmin. On that basis alone, many of the alternatives repeat, and some even exacerbate, the problems that exist in the current plans.

The Council may not extend a rebuilding period or Ttarget based on new optimistic stock assessment data. Nor may it use more optimistic data to increase mortality levels while leaving Ttarget alone. "As short as possible," providing some leeway, does not allow for longer periods unless the stock declines unexpectedly in the middle of a rebuilding period and maintaining the same Ttarget would lead to "disastrous short-term consequences." The economic leeway provided under a plan in one year cannot be expanded based on better data without making Ttarget shorter. The leeway remains the same because the "disastrous short-term consequences" that are avoided one year can presumably be avoided the next at the same low catch level.

The Council is developing a new framework for determining rebuilding periods and the annual specifications that flow from rebuilding plans. It cannot replace the existing defective framework with a less formulaic, and thus equally problematic structure. Until the Council adopts rebuilding plans that comply with the law, the Council must adopt mortality levels and accompanying management measures that lead to the shortest rebuilding period, including some leeway to avoid catastrophic economic consequences.

Additional suggestions

We have other suggestions regarding the rebuilding approach described in the draft Amendment 16-4. We urge the Council to include in any new rebuilding approach special consideration for stocks that are at levels approaching 10% of historic biomass or less. NMFS' Technical Guidance for NS1 notes that at levels as low as ½ the minimum stock size threshold—about 12% of historic levels for Pacific groundfish—it "may be necessary to set the fishing mortality rate to as close to zero as possible (i.e. to that associated with unavoidable levels of bycatch)" for a number of years.[1] The Council's own 40:10 policy calls for zero mortality at those low biomass levels. We recommend "as close to zero as possible" as a sensible starting point for setting OYs for species in that category.

We also have concerns about the implications of not fully taking uncertainty into account in stock assessments or rebuilding analyses. Shorter recovery times (i.e., revised times to recovery when F=0) in species such as darkblotched are largely driven by new, steeper stock recruitment curves. We caution against categorical acceptance of these more optimistic predictions due to uncertainties in the estimates of these stock recruitment curves. In some

[1] V.R. Restrepo et al, Technical Guidance on the Use of Precautionary Approaches to Implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Magnuson Act, NOAA Tech Mem NMFS-F/SPO-31, 1998, p. 38

cases, such as in the new assessment and rebuilding analysis of darkblotched rockfish, future recruitments are assumed to be almost entirely independent of the stock size. This apparent disconnect between stock size and recruitment seems likely to have significant error associated with it, and is likely to change with improved data. Thus, assuming a constant stock-recruit curve with no error is problematic. Uncertainty in steepness and Bo translate directly into uncertainty in Tmin, in addition to contributing uncertainty to the probability of recovery under different management scenarios. We recommend that that these uncertainties be incorporated into the rebuilding analyses to produce a more realistic range of predictions.

We plan to make additional comments once the new analysis of alternative OYs is available, and will address other topics, such as FMP goals and objectives and standards for evaluating rebuilding success, at that time. Thank you for your consideration of these comments.

Sincerely,

Karen Garrison David Newman

Point Conception Groundfishermen's Association

"Geographic representation in fisheries management"
253 Highland Drive
Channel Islands Beach, CA 93035

25 April 2006

RECEIVED
APR 28 2006
PFMC

John DeVore
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

RE: Cow Cod conservation Area outer boundary change

John,
I would like to start off by letting you and the council no how important this issue is to the small fleet that fishes for ground fish in the Southern California Bight. The CCA in its present form should have never been implemented and all were trying to do is reduce the closure to areas that have some relevance in protecting cow cod.

I have enclosed an opinion/editorial piece that I have submitted to several commercial fishing magazines. I would like this passed on to all members of the Council and put in the briefing book for the June meeting. Copies are enclosed. Thank you for any help you can provide in this matter.
If you have any questions I can be contacted at 805 984 5338 and email neptuneobs@aol.com

Sincerely,

Tim Athens

Tim Athens
President

California Department of Fish and Game continues firing in their war on commercial fishing

I am a fixed gear limited entry fisherman based in Southern California and have been involved in fishery politics most of my fishing career. I thought I had seen the worst of the ground fish management bombshells lobbed at our industry, but this latest assault on the 'sacred', Cow Cod Conservation Area, outer boundary change, truly takes the cake.

A little background history is in order. The CCA was implemented in 2001 to protect the 'hastily declared endangered' cow cod. It is commonly acknowledged that the preferred depths range of *sebastes levi* is 60 to 150 fathoms. In my 30 plus year career fishing ground fish with various types of hook and line gear, I've never encountered one deeper than 150 fathoms. Associates of mine, who have comparable experience with ground fish here in Southern California attest to similar findings. In order to protect these slow growing rockfish, the brain trusts involved with managing our fisheries decided to close huge swaths of ocean to all ground fish fishing. The main problem with their methodology was that the vast majority of turf they closed had not one thing to do with cow cod habitat. The percentage of area closed deeper than 150 fathoms was more than 70 percent of all the closed area combined. Our most productive areas for black gill, thornyheads, black cod and other slope associated species were eliminated in one fell swoop. All in the name of protecting a fish that doesn't live there.

One has to ask, why would fisheries managers take such a draconian measure? Think back to 1999/2000 when the prevailing mindset of the agencies involved was not to manage; just close everything. It was literally a feeding frenzy and the chum was our fishing grounds. I asked our State Reps on the PFMC why so much area had to be closed and was told, "Enforcement had concerns about their ability to enforce anything other than large block closures. Without VMS it's the only feasible way". Reluctantly, I accepted our fate, hoping in the years to come we would have enough info from the observer program and VMS implementation. Maybe then we would be able to right the wrong that had been bestowed upon us.

Here we are, six years later and we have a huge amount of information from the observer program. The data shows for 355 observed sets in depths greater than 150 fathoms by the fixed gear limited entry fleet there was a total of ZERO cow cod taken. I'm no schooled academic, but I am reasonably certain these statistics would indicate to any responsible fisheries manager that cow cod by-catch is not an issue with fixed gear at depths greater than 150 fathoms.

Then there's the VMS issue. At out expense, the fixed gear limited entry fleet was selected as the 'test case' and first group required to install VMS on their boats. The test must have went well, because the 'powers that be' are expanding the program to most every commercial vessel that lands or transports ground fish from federal waters. So where does that leave us? It leaves us with depth based, Rockfish Conservation Areas here in the Southern California Bight that try to follow a specific fathom curve. How are they enforced? By a number of methods, but primarily VMS.

Armed with the observer data and emphasizing the VMS program, last May 2005, I went before the California Fish and Game Commission and requested them to ask their Department to ' get the ball rolling on the CCA issue at the Council level'. Namely, change the outer boundary of the CCA to 175 fathoms for fixed gear limited entry, VMS enabled vessels. The Commission was supportive of the request and recognized the absurdity of the existing closure and the hardships it presented. Miraculously, they directed the Department to go ahead with our association's request. The Departments ground fish rep on the Council asked our Association to work with Department personnel and develop a suite of CCA options to be presented to the Council in June 2006, the Council would then choose one at that time. The options consisted of 1) status quo, 2) changing the outer boundary to 175 fathoms, our choice, and 3) maintaining some especially important areas within the existing CCA following the 175-fathom curve, but overall not a significant portion of the slope areas. This last option was adopted as a compromise because CA State enforcement officials, once again, claimed enforcement is a problem. We had made a good faith effort to work with the Department on this issue and thought we were in agreement, even though we knew the decision would ultimately be up to the Council.

It seems that there has been a complete change of attitude and protocol by the State. We were informed in April that the 'enforcement consultants' would have nothing to do with anything but a straight-line, big block approach. To make matters worse, they also said they would choose one option as the 'preferred one' to present to the Council. That doesn't exactly seem like a fair and equitable process, having the entity that wants to put the kibosh on the proposal, pick the option to be presented.

Here is a sample of the questions I've asked the various State council reps and their responses concerning this issue. What about VMS? We have it for the RCA's. It seems to work fine for that. "No, no, no, VMS is not an adequate enforcement tool; the Feds won't share the data with us". Well don't the Feds enforce with VMS? "We don't trust their competency". Can't you get the Feds to share the data with you? "No, we tried; they won't amend the Magnuson Act". What actual effort have you made to amend the Magnuson Act so info can be shared? "None". What about the patrol boats and planes? "We don't have enough money for fuel or crew". Doesn't the Coast Guard enforce federal fisheries regulations? "They don't have the time or resources". I pay my taxes. Should these issues put myself and other fishermen out of business? "That's not my concern".

Why don't they just admit it, it's glaringly obvious. Our State PFMC representatives, who are supposed to be advocates for their State's respective fisheries, don't want us fishing, simply because they're in the pockets of the environmental groups that are driving this 'ground fish jihad'.

Tim Athens
President
Point Conception Groundfishermen's Association

RECEIVED
APR 17 2006
PFMC

SIRS:

I'M WRITING, ASKING YOUR COUNCIL TO CONSIDER KEEPING THE BLACKCOD "A" FIXED GEAR QUOTA FOR THE TWO MONTH PERIOD'S AT THE 900 LB LIMITS. I HOLD TWO UNENDORSED "A" PERMITS ON MY TWO SMALL BOATS HERE IN PORT ORFORD OR. NORMALLY I FISH SALMON AND DON'T PURSUE BLACK COD BUT AS YOU KNOW THIS YEAR NO SALMON - MY BIG FEAR IS THAT YOU ALWAY'S LINK OPEN ACESS LIMITS TO THE A FIXED GEAR LIMITS, AND THIS YEAR I'M AFRAID THE OPEN ACESS BOATS ARE GOING TO FILL THIER QUOTA SO QUICKLY, AS SO MANY PEOPLE WHO HAVE NEVER LONG LINED OR GONE AFTER BLACKCOD ARE GEARING UP NOW -

OVER

ITS HARD FOR ME TO ONLY GO AFTER 300 LB'S WITH FUEL PRICES SO HIGH - I WORRY ALSO ABOUT THE INEXPERIANCED OPEN ACESS FISHER'S WHO DON'T KNOW HOW TO RELEASE FISH PROPERLY AND KILL MANY SMALL FISH BY HI GRADING - SOME HERE IN P.O. TAKE 20 TUB'S TO CATCH 900#'s AND ONLY NEED 6 TUB'S - I GUESS THEY ARE DESPARATE - I CAN ONLY HOPE YOU ARE ON TOP OF ALL THIS AND CAN HELP THE "A" BOATS TO SURVIVE - THANKS FOR YOUR TIME -

Mike Ashdown
F/V IRISH ROSE
F/V CURRY

22 May 2006

John DeVore
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

RECEIVED
MAY 2 5 2006
PFMC

RE; Cow Cod Conservation Area

Mr. John DeVore and all Council members,
Would you please support changing the entire CCA borders to the 175-fathom curve. We would prefer 150 fathoms but have compromised to 175.
Ground fish observation data in over **6000** observed sets over 150 fathoms in depth **did not catch a SINGLE cow cod.**

Presently, we have to travel 120 miles (one way) to fish for Black Gill rock fish, and with the price of fuel, the vagaries of the weather (we are a small boat) and the U.S. Navy, we are coming to the point where financial survival is a serious question.

Changing the CCA boundaries to 175 fathoms would open almost all the "old" fishing grounds. It is much closer to home and safety for my boat and crew.

The CCA does not meet California Fish and Game code 7056. Defines sustainability objectives of management systems.

(a) The fishery is conducted sustainable.
(b) The health of marine habitat is maintained and restored.
(c) Depressed fisheries are rebuilt.
(d) The fishery limits bycatch.
(e) Management system allows co-management to prevent or reduce excess effort.
(f) Fishery management systems are adaptive.
(g) The Management decision-making process is open and seeks advice and assistance of interested parties so as to consider relevant information.
(h) The management system observes long-term interests of people dependent on fishing for food, livelihood, or recreation.
(i) The adverse impacts of fishery management on small-scale fisheries, coastal communities, and local economies are minimized.
(j) Collaborative and cooperative approaches to management involve fishery participants and others and are strongly encouraged, and appropriate mechanisms are in place to resolve disputes.
(k) The management system is proactive and responds quickly.
(l) The management system is reviewed for effectiveness in achieving sustainability goals and for fairness and reasonableness in its interaction with people affected by management.

The CCA <u>does not</u> meet the standards of the Magnuson Act.

The CCA <u>does not</u> meet the standards for the Regulatory Flexibility Act.

The CA DFG <u>did not</u> oppose enforcing the 12 new reserves in the Channel Islands.

Will modification of the CCA boundaries have any significant biological impact on cow cod or its rebuilding program? **<u>NO</u>**.

<u>We are all VMS carrying boats; enforcement cannot be an issue.</u>

Phil Schenck
Owner-Operator
F/V Terri's Gale

14212 Alta Street
Westminster, California
92683

Fax to Pacific fisheries management Council.

RECEIVED
JUN 0 6 2006
PFMC

From Jim Verboon

RE rockcod season and depth Monterey Bay area

The health of this fishery has greatly increased in the last 5 years as shown by my catching early limits of quality fish on each occasion I have fished for the last 3 years. Please consider a longer season or alternating months and fishing to a deeper limit line. Thanks Jim

RECEIVED
JUN 0 6 2006
PFMC

Pacific Management Council

Dear Sirs;
In 1985 I started deck handing on charter boats thinking it was a great way of making a living I got a Captain's license. In 1991 I bought a 50 foot charter boat and started Santa Cruz Sportfishing Inc.Since then our season opener went from the middle of February to starting April 1'st too almost no season this year.People still think it is closed to all the bad press.Rockcod season was year round with no depth restrictions to a 6 month season with a 120 foot depth restrictions.This has destroyed our business forcing us to sell the big boat and buy a six pack boat and get a part time land job to keep the business going.Now with the MLPA's closing a lot of our shallow water to us maybe unemployment is a option.I understand it is the Canary Rockfish is the issue but in our area I just don't see sport fishermen contributing to the quota all that much but I am sure someone has the stats on that. Opening up the deeper water up and lighting our season could possibly save the remaining businesses(hotels, restruants,tackle stores,marine ,stores,etc.).Thanks for time.

Sincerely,
Tim Zoliniak
Santa Cruz Sportfishing Inc.
P.O.Box 5235
Santa Cruz, Ca.95063-5235

RECEIVED
JUN 06 2006
PFMC

To P.F.M.C
06/06/2006
From Pete Stelling
207 Spring St SC
CA 95060

To P.FM.C,
My daughter and I would like to see the rock cod season extended this year. Fishing is the sport that my daughter Katie and I have enjoyed so much together. I also heard we might be allowed to fish in deeper water also. Thanks for reading my letter, and hopefully you will be able to extend our rock fishing season.

Thanks

Peter Stelling
Home 831-425-3739
Fax same

RANDY'S FISHING TRIPS

A CALIFORNIA CORPORATION
66 Old Fisherman's Wharf #1
Monterey, California 939340

TEL (831) 372 – 7440
FAX (831) 372 - 7445

EMAIL – info@randysfishingtrips.com
WEB - www.randysfishingtrips.com

RECEIVED
JUN 0 6 2006
PFMC

June 04, 2006

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220

RE: Groundfish Fisheries Management Measures

As a long time member of the Recreational Sport Fishing Industry, I am writing to express strong concerns regarding the Negative Economical Impact that is being realized due to recent fishery management decisions.

While management is not in dispute, Good Management is needed, it is the decisions made that have had severe repercussions to the industry producing hardships for many. The ability to maintain business and or employment is increasingly threatened as a direct result. Several businesses have closed while others face great struggle and debt to remain in business. The Monterey Bay area party boat fleet has diminished. What was once known as a thriving fleet of close to two dozen licensed vessels is now a struggling fleet of less than ten licensed vessels due to sportsmen declining to partake in a favored activity when numerous inconsistencies and constant revisions exist in the often confusing and stringent regulations. The long term closures and current shallow water restrictions have further diminished participation.
This has also caused a severe decline in License Sales for the State of California

Conservation and Protection of fisheries is important however a better focused plan is needed. Fishing in a concentrated area (120feet or less only) would be of more harm than good. The ability to be able to fish throughout deeper waters will enhance the fisheries by taking pressure off a specific area, additionally Business and employment will once again prosper.

Respectfully Submitted,

Peter Bruno
President
Randy's Fishing Trips

RECEIVED
JUN 06 2006
PFMC

Dear P.F.M.C,

I would Enjoy a longer Rock Cod Season and deeper fishing depth...

Thanks,

Sam Tanner
Santa Cruz Fisherman

RECEIVED
JUN 06 2006
PFMC

George Lemon
1015 Hellam Street
Monterey, CA 93940

June 04, 2006

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220

RE: Groundfish Fisheries Management Measures

I am writing this letter with regards to the devastating impact that overly restrictive regulations on Rockfishing has had upon the charter fishing boat business in Monterey Bay.

Five years ago there was a total of 18 charter fishing boats that regularly fished for rock fish in the Monterey Bay. There was 12 boats in Monterey, 5 in Santa Cruz and 1 in Moss Landing. To break it down further Monterey had 4 Charter Fishing businesses with a total of 12 boats, now there a re 2 business with a total of 5 boats fishing; in Santa Cruz there was 3 businesses, now there is 2 with 2 boats; in Moss Landing there is 1 charter boat operation with 1 boat that is currently for Sale. They are calling it quits after this season.

The numbers of people going rock fishing has been declining every year. The cumulative effect of the shortened and inconsistent periods of time to fish, types of fish, size & bag limits of so many species of fish, regulations changing in the middle of the season are all vary confusing and turns the people off.

This year is quite possibly going to be our worst year ever. With Morro Bay fishing 240 feet and Monterey fishing in 120 feet it is a no brainer. I ask you, would you want to go fishing in Monterey Bay for Blue fish, a few yellow tail, a Gopher cod and a vary few Ling Cod in less than 120 feet or less when you could go to Morro Bay and catch a wide variety of fish that are for the most part bigger then the fish available in the 120 feet or less?

It should also be mentioned that a large part of both Monterey and Morro Bay's clientele comes from Fresno and the surrounding area, so when you have one port fishing in 240 feet and the other fishing 120 feet and both advertising for the same customers, you do not have to be a genius to figure out where a guy is going to spend his money.

All we want is an level playing field. Your consideration in giving Monterey 240 feet in July would be very helpful. What we really need in the future is more time on the water.

Yours Truly

George Lemon

George Lemon
Chris' Fishing Trips
Captain, F/V Star of Monterey

RECEIVED
JUN 0 6 2006
PFMC

June 6, 2006

To: PFMC

From: Ron Semenza
287 Esteban Way, San Jose CA

Re: Extending Rockfish Season and Opening fishing in deeper water.

I enjoy fishing for rockfish and would like to see these changes made. This will let the party boats fish the deeper waters and put less pressure in the shallow water where most small boat sports fisherman fish. Thank you for considering this change.

Sincerely,
Ron Semenza

Chris' Fishing Trips, Inc.

48 Fisherman's Wharf • Monterey, CA 93940 • (408) 375-5951

RECEIVED
JUN 0 6 2006
PFMC

June 5, 2006

Dear Council Members;

Our Family has been in the Sport Fishing business since 1949. I have been operating this business since 1962. In 1998 we had 8 boats, 8 skippers and 4 shop people. We now have only 3 skippers and 1 shop person.

In 1998 there were 14 boats fishing out of Montery, 6 boats out of Santa Cruz, and 2 from Moss Landing. Out of 22 Party Boats there are now only 8 boats in the South Monterey Bay Region. Two of the Party Boat companies in Monterey and two in Santa Cruz have gone out of business.

Our customer base has been reduced due to the limit restrictions, time on the water and fathom restrictions. The economic impact on our business has been devastating. No salmon and no albacore and all the restrictions we have
tried to do everything in our power to keep our skippers working and our business going. We have fished Sand Dabs, Giant Squid, Crab Combo, gone Whale Watching and have even sold some of our boats. All this in an effort to continue a business of 57 years.

We strongly urge the council ro raise the O.Y. and consider Alternative 3 (high B) for the 2007-2008 season and in July 2006 open to 40 fathoms in the South Central Monterey Bay Region.

Yours truly,

Chris Arcoleo

Chris Arcoleo
Owner

1 831 372 7445

FROM : RANDYS FISHING & WHALEWATCH FAX NO. : 1 831 372 7445 Jun. 06 2006 12:01PM P1

RECEIVED
JUN 0 6 2006
PFMC

June 5 2006

David Lemon
8231 Cove Way
Marina CA 93933

Dear Sir;

Over the past five plus years, the regulations governing the rockfish fisheries have been a total disaster for the party boat industry. In Monterey we have seen a reduction in the number of fishing party boats from a high of thirteen to a barely surviving five. The number of people going fishing for rockfish has been so greatly reduced that what was once the backbone of the business is now just a side fishery.

The constantly changing, confusing, and restrictive regulations have turned the public off of fishing for rockfish and fishing in general.

People never know when the season is open.

They are unhappy with only being able to fish for shallow water species.

They are not happy with only being able to retain ten fish for their efforts.

We need to conserve and protect our fisheries for now and the future. In the Monterey fishing area there is no shortage of fish in the general populations, deep or shallow. There are more fish available in deep water now because of the long closures. Being allowed to fish in a broader depth of water makes party boat operators better stewards of the fisheries by being able to move around and not focus on any particular area or group of fish.

Bottom line; better quality fish from increased access to deep water will mean more happy fishermen and possibly a regeneration of a sputtering business (especially with the horrible salmon season of 2006, it would be nice to finish the year in the black)

Sincerely,

David Lemon
Captain F/V Caroline

Santa Cruz County Alcohol and Drug Program

Drug Court/Prop 36 Division

265 Water St.

Santa Cruz, CA 95060

RECEIVED
JUN 0 6 2006
PFMC

FAX

Date:

Number of pages including cover sheet:

To: PFMC

Fx 1-503-820-2299

From: Dante Stewart,

Drug Court/Prop 36 Case Manager

PHONE #: (831) 454-5123

FAX #: (831) 460-9410

REMARKS: ☒ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

I HAVE I VICE, FISHING, I TAKE my Family & THEIR CHILDREN FISHING, ESPECIALLY ROCK COD FISHING, WE WOULD APPRECIATE MORE OPPORTUNITIES TO ENJOY THIS FAMILY ACTIVITY, ESPECIALLY THE KIDS ENJOY IT.

THANK YOU FOR READING THIS

SINCERELY. THE STEWART FAMILY

Lincoln County
OREGON
ESTABLISHED 1893

Terry N. Thompson
County Commissioner

Courthouse, Room 110
225 W. Olive Street
Newport, Oregon 97365
(541) 265-4100
FAX (541) 265-4176

June 5, 2006

Randy Fisher, Director
Pacific States Marine Fisheries Commission
205 SE Spokane Street
Portland, OR 97202

Dear Mr. Fisher:

I received the Socioeconomics Program Questionnaire from Ms. Nicole Milne from the National Marine Fisheries Service and shared it with several people in Lincoln County, including the Lincoln County Historical Society. As I mentioned to her in a phone conversation, people who have reviewed the document are tremendously concerned about the inaccuracy of the information. Knowing that she is working on this project alone helps me understand why the information is so. However, I want to stress the value that lies in taking advantage of local resources, such as myself, to assist her in compiling a more detailed list of local contacts to make the document an important database that can be relied upon by numerous agencies, commercial fishermen, and industry scientists.

One glaring example of an inaccuracy is the statement that South Beach and Newport are two separate communities. People who live here consider South Beach and Newport one community. Indeed, South Beach is located within the city limits of the City of Newport. The vessels that she described as being owned by South Beach residents all conduct their business out of the Port of Newport facility on the north side of Yaquina Bay. Any data will be skewed if the information is broken down by individual community and not the general area.

Frankly, the information about our area is so inaccurate that I feel compelled, in the strongest possible terms, to convey my concerns. The need for accurate socio-economic information grows every day. Commercial fishermen are eager to share their knowledge of the sea and local industry, and to work hand-in-hand with the scientific community to integrate what the industry knows with what the scientific community has learned. We have so much to gain through cooperation. In my experience, the National Marine Fisheries Service has only paid lip service to the vital role this type of data can play in modern fisheries management. Getting information directly from the source – the local fishermen – can generate a wealth of data and provide a credible and thorough database on the socioeconomics of fisheries management. Conducting inadequate research which leads to inaccurate information is highly counterproductive. Publishing such information would be a detriment to the communities themselves.

Here are some recommendations that could help achieve a more complete research effort:

1. Contact people on a local level. I will be happy to brainstorm a list of contacts.
2. Split the work up by state since many of the governance structures change from state to state and year to year.
3. Hire a separate person to become an expert on each state and expand and update the database yearly.
4. Prior to publication, submit the data collected with each State Department of Fisheries to check its accuracy.
5. Learn about any programs that are currently underway in which local fishermen are working with the scientific community, such as the Port Liaison Project, Undersea Cable Committee, and the Oregon Sea Grant.

Collecting all the data for this research is an insurmountable job for only one person. I believe additional staff may have to be hired to conduct separate areas of research, or, NMFS needs to strongly consider contracting with local people who have the skills to assemble this information. Publishing and relying upon inaccurate information will lead to greater financial losses over time.

As I explained to Ms. Milne earlier, I cannot enumerate all the errors in the research in a single phone call or letter. I am willing, however, to meet with her and other local contacts to get the project moving in the right direction. This is exciting work. It holds tremendous promise for providing a reference point from which future researchers can build. Lincoln County stands ready to help develop a more complete and accurate picture of the people and history that are the cornerstone of our nation's fisheries.

Sincerely,

Terry N. Thompson
Commissioner

cc: Representative Peter DeFazio
Representative Darlene Hooley
Don McIsaac, Director, Pacific Fishery Management Council
Nicole Milne, National Marine Fisheries Service
Senator Gordon Smith
Dr. Usha Varanasi, Science and Research Director, Northwest Fisheries Science Center
Representative David Wu
Senator Ron Wyden

F

MEMORANDUM

RECEIVED
JUN 0 6 2006
PFMC

Date/Time: 6/6/2006; 6:17 AM

To: P.F.M.C.

From: Vic Giacalone
442 Park Ave.
San Jose, CA 95110
work 408 287-2040
home 408 298-3945

re Rockfishing

I am a recreational fisherman. Fishing is something, which I enjoy immensely.

However, in the past few years my ability to fish in the ocean has been dramatically curtailed, due to the short season in effect for rock fishing.

In addition, I understand the populations of most species is healthy.

So, I would ask that you consider extending the season to target these fishes for as long as possible.

Thank you.

Subject: Ground fish regs.
From: CWoo411848@aol.com
Date: Tue, 6 Jun 2006 11:36:33 EDT
To: pfmc.comments@noaa.gov

Upcoming council meeting in June 2006.
Why not allow sportsfishermen to fish a longer season and deeper water. We sportsfishermen really do enjoy the rock cod fishing that we have here in Central California(Monterey Bay area). There some of us that don't have that much more time to fish so it would be great if the council would lengthen the season and allow fishing in deeper waters. Scientifically, I haven't seen where the sportfishing for the rockcod has impacted there numbers.
Thank you for this consideration.
Conway Woo, D.D.S.

Subject: Comment on rock fish regulations
From: "Bill Woods" <bill.woods@earthlink.net>
Date: Tue, 6 Jun 2006 09:33:25 -0700
To: <pfmc.comments@noaa.gov>

I've heard through the grapevine that the PFMC is considering regulations for next year, and that comment at this time is appropriate. I live in Aptos, California. My personal fishing activity is recreational, usually out of Santa Cruz. Thank you for considering the following comments:

1. Most important - Please do whatever is necessary, including complete closures if the science is sound, to protect existing brood stocks from any further decline.
2. Please give appropriate attention to the size and age of brood fish - not just a total biomass measure - in your assessment of population viability. The science does seem clear on the importance of large, old female rock fish in the population.
3. Where harvest opportunities are deemed to exist, please allocate fish in a manner that maximizes public benefit, based on comprehensive analysis. My opinion is that the total utility, enjoyment and economic value per fish is significantly greater when those fish are harvested by recreational fishermen. I am sympathetic to the impacts this shift might have on commercial fishermen, but wild fish are a finite resource. It is consistent with the values of our society to protect wild fish in the same way wild terrestrial creatures are treated. Commercial harvest of wild birds and mammals is completely prohibited everywhere in the United States. In terms of social values, why should commercial fishing be different? (And, yes, I agree there should be compensation to the displaced commercial fishermen.)
4. Reduce "bycatch" tolerances by at least 90%. The magnitude of allowed - and often wasted - bycatch in relation to the restrictions, limits and penalties placed on recreational fishing is ridiculous, appalling, and undermines the credibility of the entire process.
5. Look for more sensible, enforceable, recreational fishing regulations than the ones we have had lately. Determine whether any release of fish caught at depth is feasible. Then make rules that are consistent with those findings - and educate fishermen about proper techniques. Don't force people to waste fish that will not survive release, and don't allow fishing where this is likely to happen.

Again, thank you for considering my input.

Sincerely,

Bill Woods

winmail.dat

Agenda Item F.2.d
Supplemental Public Comment 2
June 2006

Washington Trollers Association
P.O. Box 2185
Westport WA 98595

Phone/Fax: (360) 648-2414
E-mail: dsaul@centurytel.net

June 11, 2006

Mr. Donald K Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland OR. 97220-1384

Dear Mr. Hansen:

The Washington Trollers Association (WTA) is made up of approximately 100 members and represents the majority of the salmon trollers that troll for salmon off of the Washington coast. The WTA is aware of the requirements of the Magnuson Act and the Court's interpretation of what actions need to happen in order to demonstrate that Yelloweye groundfish are managed on a recovery schedule. The PFMC is required to consider the effects of even the smallest bycatch encounters of Yelloweye in fisheries such as the salmon troll fishery or demonstrate that the PFMC managed fisheries will allow a recovery of Yelloweye groundfish. WTA representatives have met with WDFW staff and discussed ways that the Washington Trollers can help in the recovery of Yelloweye. However, because of a lack of communication, we were totally surprised by the WDFW Report Agenda Item F.2.b that was released in early June 2006. The WDFW report proposes a no fishing zone of a vast area of prime salmon trolling area that we think is not justified as Yelloweye habitat or abundance.
The following points are made from our understanding of the science and the interaction of salmon trolling and Yelloweye encounters.

- Yelloweye are very sedimentary and live close to the bottom around high relief rocks.
- Bottom trawlers encounter very few Yelloweye because they trawl primarily in flat bottom and avoid rocky reefs. Especially since large foot ropes and rock hopper gear was eliminated in the last few years. (This regulation change should have dramatic affect to help Yelloweye recover.)
- Salmon trollers seldom encounter Yelloweye because of the difficulty trolling close to the bottom around high rocky relief sites.
- The information on salmon troll encounters with Yelloweye was found by the advisory teams not to be statistically ~~usable.~~ unusalbe.
- The Yelloweye protection area proposed by the referenced WDFW Report as a no fishing zone is a high production salmon area that happened to produce most of the salmon trolling opportunity this last month and includes vast areas of flat trawlable terrain that do not include high rocky relief that Yelloweye habitat.

- We have unique rockfish conservation areas designed for each of the major gear types that incidentally encounter rockfish to include longline, trawl, and sport. Salmon troll gear is different and should have unique areas of no salmon troll fishing to protect rockfish as well. It should be reasonably easy for enforcement to determine the difference between vessels trolling with hooks and vessels using other types of gear.
- In the area proposed for "no fishing in 2007-2008 cycle" in the WDFW report referenced above, there has been several observed salmon troll trips in 2005 and 2006. As far as we know, there have been no encounters of Yelloweye while trolling for salmon in the same areas.

Taking the preceding into consideration, and understanding that because of our low encounter rate of Yelloweye in the troll fishery, the models estimating Yelloweye recovery will not be affected by any measures taken by the troll fleet short of completely closing the fishery. WTA is concerned and understands the pressure brought by the environmental community and the courts to do all reasonably possible to ensure that the Yelloweye recovers in the quickest time possible. WTA has reviewed the submersible data from the North Washington Coast and found high abundance of Yelloweye in an area off of Cape Flattery in an area called the "table top" at 48 24' N by 124 53' W. This is in the no trolling area that is commonly called "mushroom closure". Many of our trollers have used other types of gear in past years that targeted Yelloweye and know of several places of good habitat and high abundance of Yelloweye that is protected from trolling in the closed to trolling "mushroom area".

If it is necessary to satisfy the Court Mandate for the recovery of Yelloweye, WTA is forwarding the following alternative for consideration as additional closed to trolling area for 2007-2008. WTA is forwarding for consideration an area bounded by 125 16.5 W, 125 14.0' W, 48 00' N, 48 02' N. This proposed closed area should not be considered for expansion as the submersible data information show this area as extreme high rocky relief with high abundance of Yelloweye and some adjoining areas are flat and not good Yelloweye habitat.

Sincerely,

Doug Fricke

Doug Fricke, WTA President

STAGNARO
Fishing Trips & Bay Cruises
Santa Cruz, California
PO Box 1340, Santa Cruz, CA 95061

Agenda Item F.2.d
6/06

Pacific Fishery Management Council,

MY NAME IS KEN STAGNARO. I AM FROM STAGNARO SPORTFISHING IN SANTA CRUZ AND MONTEREY BAY AREA. MY FAMILY'S BUSINESS HAS BEEN IN EXISTENCE SINCE THE EARLY 1930'S. OUR FLEET ONCE CONSISTED OF AS MANY AS 14 CHARTER BOATS. IN 2006 ONE BOAT IS ALL THAT IS LEFT. IN A BROADER PICTURE IN THE LATE 1990'S THERE WERE APPROXIMATELY 20 COAST GUARD CERTIFIED COMMERCIAL PASSENGER FISHING BOATS IN MONTEREY BAY. NOW THERE ARE SEVEN! AND ONE OF THOSE IS FOR SALE. IN FACT IM SURE THERE ARE OTHERS WHO WOULD SELL JUST TO KEEP THEIR COLLECTIVE SHIRTS. I OFTEN HAVE A SARCASTIC CHUCKLE WHEN I READ AN ECONOMIC IMPACT REPORT AS TO THE LATEST RESTRICTIONS OR SEASON CLOSURE, ESPECIALLY THE PART THAT SAYS "MAY EFFECT SMALL BUSINESS" THERE IS AN UNDERSTATEMENT.

IT IS A FULL TIME JOB TO KEEP UP ON ALL OF THE STUFF YOU LAW MAKERS AND NUMBER CRUNCHERS CAN COME UP WITH. FOR THE MOMENT I HAVE A FULL TIME JOB. BUT AS I SEE IT IF IT WERE NOT FOR THE CANARY, GOLDEN EYE AND BOCACCIO ROCKFISH WE MIGHT STILL HAVE A 12 MONTH SEASON WITHOUT DEPTH RESTRICTIONS. ALTHOUGH I AM SURE IT CAN BE DIFFERENT IN OTHER AREAS AND ON COMMERCIAL TRAWLERS. BUT ON OUR BOATS CANARY'S AND GOLDEN EYE HAVE ALWAYS BEEN A VERY SMALL PERCENTAGE OF OUR CATCH GOING BACK TO THE 1960'S. ON AVERAGE MAYBE 10% OR LESS. EVEN MUCH LESS FOR GOLDEN EYE. IF THE LAW ALLOWED US A LONGER SEASON AND GREATER DEPTH I AM CERTAIN I CAN ACHIEVE VERY CLOSE TO ZERO PERCENT CANARY AND GOLDEN EYE. FURTHER, I MOSTLY FISH FROM ANO NUEVO TO THE NORTH DOWN TO THE MONTEREY CANYON OFF MOSS LANDING TO THE SOUTH. THE REEF'S AND ROCKFISH HABITAT IN THIS AREA AMOUNT TO APPROXIMATELY 90 SQUARE MILES. APPROXIMATELY 75 SQUARE MILES OF THIS AREA IS DEEPER THAN 120 FEET. AND AFTER HAVING ONLY 15 SQ. MILES TO WORK IN FOR SEVERAL YEARS, THE NEW MPA'S THREATEN TO TAKE EVEN MORE AREA FROM US. IN SHORT OUR INDUSTRY WILL NOT SURVIVE WITHOUT A LONGER SEASON AND DEPTH LIMIT. I ASK THAT THE OPTION WHICH PROVIDES FOR THE MOST LIBERAL OF SEASONS AND DEPTH RESTRICTION BE ADOPTED. THANK YOU,

KEN STAGNARO

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE MOTION ON THE TENTATIVE ADOPTION OF THE 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

I move that the Council tentatively approve the following management measures, as described in the Action Alternatives in the draft Environmental Impact Statement, for preliminary action:

<u>WASHINGTON RECREATIONAL FISHERIES</u>

Statewide Measures:

- Maintain status quo bag limits as described in the No Action Alternative (Chapter 2, p. 52), which include a recreational groundfish bag limit of 15 fish per day, including rockfish and lingcod, with a sublimit of 10 rockfish, and 2 lingcod. Retention of canary and yelloweye rockfish is prohibited.

- Maintain status quo lingcod season as described in the No Action Alternative (Chapter 2, p. 52); in 2007 and 2008, the following lingcod seasons would apply:

  - Marine Areas 1-3: Open the Saturday closest to March 15 (which is March 17 in 2007 and March 15 in 2008) through the Saturday closest to October 15 (which is October 13 in 2007 and October 18 in 2008).

  - Marine Area 4: Open April 15 through October 13 in 2007 and open April 15 through October 15 in 2008.

- Reduce the minimum size for lingcod from 24 inches to 22 inches.

Area-Specific Measures:

Management Measures for Marine Areas 3 and 4 (Queets River to U.S./Canada border)

Action Alternative 3 (Chapter 2, p. 89), with two revisions: Prohibit fishing for, retention, and possession of **<u>groundfish</u>** seaward of a line approximating 20 fm from May 1 through **<u>September 30</u>**, except on days that halibut fishing is open.

Revisions:
1. Change “rockfish and lingcod” to more broadly cover “all groundfish” for ease of regulatory understanding and enforcement of the regulations
2. Move the depth restriction in July from 10 fm seaward to 20 fm

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Action Alternative 3 (Chapter 2, p. 89), with one revision: Prohibit fishing for, retention, and possession of **<u>groundfish</u>** seaward of a line approximating 30 fm from the lingcod opening day in March through April 30, and from June 16 through July 31. From May 1 through June 15 (i.e., during the average period of the South Coast halibut fishery), allow the retention of sablefish and Pacific cod seaward of the 30-fm depth restriction.

Revision:

1. Change “rockfish and lingcod” to more broadly cover “all groundfish” for ease of regulatory understanding and enforcement of the regulations, while still allowing the retention of sablefish and Pacific cod, which may be caught incidentally while targeting halibut offshore.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

No Action Alternative (Chapter 2, p. 54), which would prohibit fishing for, retention, and possession of groundfish, except sablefish and Pacific cod, when Pacific halibut are onboard the vessel.

This suite of management measures would result in the following estimated mortalities of overfished rockfish for Washington recreational fisheries:

Bocaccio	Canary	Cowcod	Darkblotched	POP	Widow	Yelloweye
0	1.1	0	0	0	0	3.1

Yelloweye Rockfish Conservation Areas (YRCAs)

- Maintain the “C-shaped” YRCA (Chapter 2, Figure 2-4, p. 53) in the Washington North Coast area, as depicted by coordinates in federal regulations at 50 CFR 660.390. Recreational fishing for, retention, and possession of groundfish and Pacific halibut is prohibited within this area, and this area is defined as a voluntary “area to be avoided” for commercial fixed gear and salmon troll fisheries.

- Add an additional YRCA in the Washington North Coast area, labeled North Coast Area B, under Action Alternative 1 (Chapter 2, Figure 2-8, p. 65), as described by the following coordinates:

  Beginning at 48°11.77’ N lat., 125°13.03’ W long.;
  Then to 48° 16.43’ N lat., 125°07.55’ W long.;
  Then to 48° 14.72’ N lat., 125°01.84’ W long.;
  Then to 48°13.36’ N lat., 125°03.20’ W long.;
  Then to 48°12.74’ N lat., 125°05.83’ W long.;
  Then to 48°11.55’ N lat., 125°04.99’ W long.;
  Then to 48°09.96’ N lat., 125°06.63’ W long.;
  Then to 48°09.68’ N lat., 125°08.75’ W long.;
  And back to the point of origin.

  This area would be closed to commercial limited entry fixed gear and open access groundfish fishing. WDFW notes that this area is already closed to trawl gear with the implementation of the trawl rockfish conservation area and the essential fish habitat trawl closure; most of this area is also closed to salmon troll as a salmon conservation measure.

- Add an additional YRCA in the Washington North Coast area, under Action Alternative 1 (Chapter 2, Figure 2-11, p. 69), as described by the following coordinates:

  Beginning at 48°00.00’ N lat., 125°14.00’ W long.;
  Then to 48°02.00’ N lat., 125°14.00’ W long.;
  Then to 48°00.00’ N lat., 125°16.50’ W long.;
  Then to 48°02.00’ N lat., 125°16.50’ W long.;
  And back to the point of origin.

  This area would be closed to the commercial salmon troll fishery. WDFW would like to point out that this area overlaps a portion of the “C-shaped” YRCA, and is already closed to recreational groundfish and halibut fishing.

- Add an additional YRCA to in the Washington South Coast area, labeled South Coast Area B, under Action Alternative 1 (Chapter 2, Figure 2-9, p. 66), as described by the following coordinates:

  Beginning at 46°58.00’ N lat., 124°48.00’ W long.;
  Then to 46°55.00’ N lat., 124°48.00’ W long.;
  Then to 46°58.00’ N lat., 124°49.00’ W long.;
  Then to 46°55.00’ N lat., 124°49.00’ W long.;
  And back to the point of origin.

  This area would be closed to recreational fishing for groundfish and Pacific halibut and would be a voluntary “area to be avoided” for commercial groundfish fisheries.

We believe these proposed area closures will assist in the conservation and rebuilding of yellowye rockfish and, while the primary purpose for these closures is yelloweye protection, we also believe that there will be additional benefits for canary rockfish as well.

As mentioned in Agenda Item F.2.b, WDFW Report, even though we are not able to quantify the amount of reduced yelloweye rockfish mortality resulting from implementing these conservation areas, the Washington Department of Fish and Wildlife did review available yelloweye rockfish encounter data. We plotted the coordinates of the closed areas with Geographic Information Systems (GIS) software with overlays of state observer data from recreational, salmon troll, and exempted fisheries for trawl and longline, groundfish trawl logbook data, and data from the annual International Pacific Halibut Commission (IPHC) halibut survey, the National Marine Fisheries Service triennial trawl survey, and the WDFW submersible survey for yelloweye. Based on this review, and information communicated from recreational and commercial fishers, we believe that closing these areas to the specified fisheries will help conserve yelloweye rockfish. Over the next 18 months, we will have a series of meetings with recreational and commercial fishers to complete a more comprehensive review of the data and information about fishing locations to further refine and these YRCAs and potentially define new sites.

Agenda Item F.3
Situation Summary
June 2006

TRAWL INDIVIDUAL QUOTA ANALYSIS--REVIEW OF STAGE ONE

The drafting of the analytical document for the trawl individual quota (TIQ) program has been divided into two stages. This two stage process was developed as a response to funding that was not sufficient to cover a complete analytical document. The first stage work product for the analytical document has been carried out under contract and includes specification of the impacts that will be evaluated along with the approach and methods that will be used in the evaluation.

A summary of the current status of this project is provided in Agenda Item F.3.a Attachment 1. Drafting of the analysis has been underway since last fall A workshop to provide an opportunity for public involvement in the drafting process was held April 18-20, 2006 in Portland, Oregon and a report is provided as Agenda Item F.3.b, Workshop Report (*on Council briefing book CD*).

At this meeting the Council will review the contractor work product on the first stage of development of the analysis and determine whether adjustments are needed to the analytical approach or any of the alternatives (Agenda Item F.3.b, Attachment 1—excerpt from Stage I Draft). The contractor has identified some areas for which adjustments may be appropriate at this time, expressed concern about the number of permutations contained in the alternatives, and expressed concern that analysis of some design elements may uncover problems which indicate that other options should have been considered. With respect to these issues, the contractor's primary concern is excessive permutations and the possible need to reconsider some design elements at the end of the process, which may escalate costs. To address these issues Council staff has initiated the following for Council consideration at this meeting:

(1) Reorganization of some of the main elements of the alternatives in order to streamline the analysis.
(2) Adjustments to some of the design elements.
    (Agenda Item F.3.a, Attachment 2 and Agenda Item F.3.c, Supplemental TIQC Report)

The staff will compile the results of Council deliberations from this meeting and ask the Council to confirm any stage one modifications at its September meeting. The confirmation in September will allow the Groundfish Management Team, Groundfish Advisory Subpanel, and others who have been fully subscribed with the biennial specifications process to offer the Council their recommendations on this matter. September confirmation of the stage one actions is not expected to cause any delay in the work on stage two as there are many aspects of the analysis which will not be driven by the types of adjustments that the Council will be considering.

Council Task:

1. **Identify any other impacts that should be considered or problems with the planned approach to the analysis.**
2. **Consider the need for any revisions to the current alternatives.**

Reference Materials:

1. Agenda Item F.3.a, Attachment 1: Groundfish Trawl Individual Quotas, Pacific Fishery Management Council (Council) Status Report, June 2006.
2. Agenda Item F.3.a, Attachment 2: Staff Report: Issues for Council Consideration.
3. Agenda Item F.3.b, Attachment 1: Excerpt from Stage 1 Draft IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery (Chapters 1, 2, 4 and Appendices A-C).
4. Agenda Item F.3.b, Attachment 1 **ERRATA:** Stage 1 Draft IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery, **Table 2-1.**
5. Agenda Item F.3.b, Attachment 2: Stage 1 Draft IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery **(electronic copy on Council briefing book CD)**.
6. Agenda Item F.3.b, Workshop Report **(electronic copy on Council briefing book CD)**.
7. Agenda Item F.3.c, Supplemental TIQC Report.
8. Agenda Item F.3.d, Public Comment.

Agenda Order:

a.	Agenda Item Overview	Jim Seger
b.	Contractor Report (Northern Economics, Inc.)	Marcus Hartley
c.	Reports and Comments of Advisory Bodies	
d.	Public Comment	
e.	Council Discussion and Guidance on Completing Stage I	

PFMC
05/29/06

Groundfish Trawl Individual Quotas *(TIQ)*
Pacific Fishery Management Council (Council) Status Report
June 2006

Summary of Project Status

Most Recent Actions:

- Council (June 2005)
  - adopted a set of TIQ alternatives for analysis
  - authorized the initiation of scoping for an intersector allocation Environmental Impact Statement **(EIS)**
- Council (November 2005)
  - reviewed provisions and made recommendations for addressing community concerns
  - eliminated an alternative that would have required TIQ for overfished species only
- Allocation Committee (November 2005)
  - met to develop intersector allocation alternatives
- Independent Experts Panel (March 2006)
  - met to review internal review draft of document to be presented at the April 18-20 workshop
- Public workshop held on stage 1 of the analytical process (April18-20, 2006)

Current Activities:

- Drafting of the TIQ analytical package (including EIS) is in progress under a contract with Northern Economics Incorporated **(NEI)**. The stage 1 draft, analytical approaches and methods will be presented for Council review at its June 2006 meeting.
- Public scoping for the intersector allocation is underway and historic harvest data is being summarized by sector. The Council will take up intersector allocation at its September 2006 meeting.

Next Major Events:

Date	Event	Location
June 11-16, 2006	**Council Meeting**: • Review Stage 1 Draft TIQ Analytical Package • Determine need to modify alternatives	Foster City, CA (San Francisco Bay Area)
Summer, 2006	TIQC Meeting to review interim components analysis.	Portland, OR
Sept, 2006	**Council Meeting** • Review interim components analysis. • Confirm June action on Stage 1 draft • Review scoping results on intersector allocation	Foster City, CA

Funding Status (TIQ Program and Intersector Allocation)

The projected Council funding need for full development of a TIQ system includes both deliberations on the design of a TIQ program and the intersector allocations necessary to determine the share of the optimum yield to be allocated to the trawl fishery.

Total Council need:	$2,250,000 (updated December 2005)
Total received:	$555,000
Total remaining need:	$1,695,000

Contract Work Status

Drafting the TIQ Analytical Package. The Council has entered into a contract with NEI in October 2005 to begin work on the TIQ analytical package. Drafting of the analytical package for the TIQ program has been divided into two stages because funding was not available to allow development of a complete package. The analytical package includes an EIS, regulatory impact review, regulatory flexibility analysis, and fishery impact statement, along with other required analyses. Funding for the full analysis will need to be secured prior to the end of the first stage in order for the analytical process to proceed to completion without further interruption.

An outline of the analysis and types of impacts to be evaluated was presented at a public workshop April 18-20, 2006. The document will be further developed and revised in response to information and comments received at the workshop. It will then be presented to the Council at its June 2006 meeting. The second stage of drafting will commence when the first stage is completed and needed funding has been secured.

Data summaries for Intersector Allocation. Summaries of historic harvest data for the commercial and recreational fisheries were compiled under contract with Dr. Edward Waters and presented to the Allocation Committee at its November 2005 meeting.

Committee Activity Status

TIQ Committee (TIQC)

The TIQC is the lead constituent committee advising the Council on development of the TIQ program. The TIQC has met six times, first in October 2003 and last in October 2005. Its first five meetings led to the development of the set of options adopted for analysis by the Council at its June 2005 meeting. At its October 2005 meeting, the TIQC reviewed alternatives developed by the TIQ Analytical Team to address community concerns.

TIQC members were given the opportunity to participate in an internal review of a preliminary draft of the analytical package under development by NEI and participate in the April 18-20, 2006 workshop on the draft stage 1 analysis. Upcoming activities for the TIQC include a one day meeting at the June 2006 Council meeting to review the draft NEI work product and a meeting in the summer of 2006 to review an interim analysis of some of the components of the alternatives.

TIQ Analytical Team (AT)

The AT has met four times, first in June 2004 and last in November 2004. At its November 2004 meeting, a work plan was developed for conducting additional analyses in support of TIQC policy deliberations to occur from January through May 2005. The work plan was only partially implemented due to a shortfall in the funding available for contractors working in support of the AT.

The last major work product of the AT was a set of community related options for Council consideration. The analytical basis for the options was presented to the Scientific and Statistical Committee (SSC) at its September 2005 meeting and the options were reviewed by the Council at its November 2005 meeting.

Establishment of a contract with NEI has resulted in a shift in the roll of the AT. Rather than taking the lead in developing analyses, the AT role is now to provide expert advice to NEI on development of the analyses and to review NEI work products.

AT members attended the meeting of the IEP on March 16, 2006, and participated in the April 18-20, 2006 workshop on the draft stage 1 analysis.

TIQ Independent Experts Panel (IEP)

The IEP met two times, first in June 2004 and last in September 2004. Their first meeting was a joint meeting with the TIQ AT. At their September 2004 meeting, they recommended revisions to the goals and objectives, which were later adopted by the Council. The IEP also specified a process for its review of the draft analysis to be developed by the TIQ AT once the Council adopted alternatives for analysis. Since that time, workload and funding considerations have led to the transfer of the main responsibility for drafting analyses to the outside contractor (NEI).

Recent activities of the IEP included internal review of preliminary drafts developed by NEI prior to the April 18-20, 2006 workshop. IEP members were not available for the April workshop. A special meeting was held March 16, 2006 to provide NEI with an opportunity to receive advice from members of the IEP. A complete draft was not available at that time. The IEP agreed that it would meet again early on in the next stage of the drafting process, after some of the methods had been applied and initial results developed.

TIQ Enforcement Group (EG)

The TIQ EG met two times, first in May 2004 and last in September 2004. The TIQ EG developed enforcement alternatives and estimates of enforcement costs for status quo and management under a generic, catch-based individual quota program.

In December 2005, TIQ EG members were given the opportunity to participate in an internal review of a preliminary draft document developed by NEI. Some EG members participated in the April 18-20, 2006 workshop. The next task for the EG will be to review preliminary results from the analysis, when they become available.

Scientific and Statistical Committee (SSC)

The SSC has been involved in review of the TIQ program only when it has come before the Council for major actions. The SSC reviewed the TIQ program alternatives at its November 2004 meeting and provided comments to the Council. It reiterated those comments at the June 2005 Council meeting. In June 2005, the Council charged the AT to work with the SSC to draft options to address community concerns. The SSC reviewed the technical basis for the options developed by the AT at the September 2005 SSC meeting and provided comments at the November 2005 Council meeting.

SSC members Mike Dalton, Tom Jagielo, Hans Radtke, and David Sampson have agreed to take the lead for the SSC in tracking and reviewing development of the TIQ program. The SSC has been asked to participate in the internal review of preliminary drafts of the analysis developed by NEI. The SSC subgroup participated at the April 18-20, 2006 workshop. The next task for the SSC will be to review and comment to the Council on the contractor stage 1 analysis being provided at the June 2006 Council meeting.

Groundfish Management Team (GMT)

The GMT last reviewed and commented to the Council on the TIQ program at the June 2005 Council meeting. Merrick Burden is the GMT lead on the TIQ process. A GMT representative (Mark Saelens) attended the March 16, 2006 meeting of the IEP and the April 18-20 workshop on the draft stage 1 analysis. Because of other workload related to the 2007-2008 annual specifications process, the GMT will not have had time to review the draft stage 1 analysis for the June Council meeting. They will have an opportunity to review the document over the summer and provide comments at the September 2006 Council meeting.

Groundfish Advisory Panel (GAP)

The GAP reviews TIQ issues as they arise on the Council agenda. The GAP last advised the Council on the TIQ program at the November 2005 Council meeting, at which time, options to address community concerns were considered.

In December 2005, GAP members were given the opportunity to participate in an internal review of a preliminary draft of the analytical package under development by NEI. GAP members were invited to participate at the April 18-20, 2006 workshop. Because of workload related to the 2007-2008 annual specifications process, the GAP will not have had time to review the draft stage 1 analysis at the June Council meeting. They will have an opportunity to review the document and provide comments at the September 2006 Council meeting.

Allocation Committee

The Allocation Committee role is to address aspects of the TIQ system directly impacting other sectors. The main direct impact is the development of the intersector allocations necessary to determine the share of fish that will be available for the TIQ program. The Allocation Committee has requested data summaries and begun development of some approaches for determining the priorities and methods for resolving intersector allocation issues. An initial summary of historic harvest data was presented at the November 2005 Allocation Committee meeting. Data issues need to be resolved pertaining to (1) the source from which the recreational data was drawn and (2) commercial landings that could not be assigned to a sector of the fleet. The next Allocation Committee meeting focusing on the long-term intersector allocation issue may occur over the summer.

Agenda Item F.3.a
Attachment 2
June 2006

STAFF REPORT:
ISSUES FOR COUNCIL CONSIDERATION

There are two main decision areas to be addressed in the trawl individual fishing quota (IFQ) analysis:

1. specification of the broader management regime within which the IFQ program or permit stacking would be implemented, and
2. specification of the IFQ program and permit stacking alternatives.

Proposals are presented here for reorganizing the alternatives addressing each of these decision areas, to facilitate a more efficient and informative analysis. Additionally, with respect to each of these areas, there are a number of design issues which, if addressed at the June and fall 2006 meetings, may facilitate a more targeted and efficient analysis. Resolution in one of these areas, processor definitions and supporting data, is essential in order to proceed with an analysis of an initial allocation of IFQ to processors.

Management Regime Alternatives

Restructuring

TASK: Provide guidance, if the proposed reorganization is not acceptable.

At its June 2005 meeting, the Council was presented with the suite of management regime alternatives identified in the first column of the following table. Council actions in June and November 2005 left the management regime alternatives specified in the second column. In the process of developing plans for the analysis, it became apparent that there were not broad differences between Alternative 3 and Alternative 4 in the second column. Alternative 3 provided an option for low OY management[1] and Alternative 4 did not provide such an option. Maintaining separate alternatives to address these differences would require substantial repetition and not provide more information than could be provided by treating the differences as options within a single alternative. Therefore, Alternatives 3 and 4 have been tentatively combined into a single alternative for Council consideration and are presented as such in the stage one analysis. If the Council would like to maintain separate alternatives to address the low OY management issue, analysts are prepared to make the necessary modifications to the stage one analysis before proceeding.

Alternatives in the Scoping Document, as of June 2005	Alternatives after Council Actions, as of November 2005	Revised Alternatives (Proposed for Consideration June 2006)
1. No Action 2. IFQ for Trawl Target Species and Species for Which There is a Trawl Allocation 3. IFQ for Groundfish Except "Other Fish" 4. IFQ for All Groundfish and Options for Halibut IBQ 5. Cumulative Catch Limits 6. Cumulative Catch Limits and Permit Stacking 7. Cumulative Catch Limits and Permit Stacking with Extended Cumulative Limit Periods	1: No Action 2: IFQs for Trawl Target and Species for Which There is a Trawl Allocation 3: IFQs for All Groundfish Species Except "Other Fish" and Low OY Management 4: IFQs for All Groundfish Species Except "Other Fish" and No Low OY Management 5. IFQs for All Groundfish 6 Permit Stacking with Full Cumulative Catch Limits for Each Stacked Permit (No Extended Periods).	1: No Action 2: IFQs for Trawl Target and Species for Which There is a Trawl Allocation 3: IFQs for All Groundfish Species Except "Other Fish" (options with and without low OY management) 4. IFQs for All Groundfish 5. Permit Stacking with Full Cumulative Catch Limits for Each Stacked Permit (No Extended Periods).

(NOTES: "IFQs Only For Overfished Species" was added as an alternative in June but removed from consideration in November. Alternative 2 also includes low OY management provisions.)

Specification of Design Elements

The IFQ management regime alternatives (Tables 2-1 and 2-3 in Agenda Item F.3.b, Attachment 1) do not completely address the rules that would apply for vessels participating in both the shoreside whiting and shoreside nonwhiting fisheries (Element 2) and in both the limited entry trawl and limited entry fixed gear fishery (Element 3.2). Similarly, the permit stacking alternatives did not completely address these combinations, nor did they address the use of trawl and open access gears (exempted gear and unendorsed longline or fishpot) (Element 3.1). Three other areas not completely specified were whether there should be accumulation caps on transferable cumulative limits (Element 1.3), procedures for rolling over whiting IFQ between whiting sectors (Element 2.3), and the possible extension of the cumulative limit period to longer than 2 months (Element 2.4). Finally, outstanding was the issue of the threshold that might be applied for determining when low OY management measures should be applied (Element 1.4). The TIQC is being asked to review and report recommendations to the Council on each of these issues.

[1] For Alternative 3 in the 2nd column, when a species was determined to be at low biomass levels, management of that species would have switched from IFQs to nontransferable cumulative limits.

Three elements have been added to the end of the management regime alternatives in order to fill out the permit stacking alternative and cover related decisions in one place: Element 4, at-sea monitoring; Element 5, area management; and Element 6, sector allocations. The provisions for these elements are not new and are derived from decision tables in the scoping document.

Vessels Participating in Both the Shoreside Whiting and Shoreside Nonwhiting Fisheries

TASK: Provide guidance, if the proposed options are not acceptable.

Provisions have tentatively been added to the alternatives specifying that a whiting closure for shoreside trips would be implemented by the imposition of a whiting cumulative catch limit (all alternatives) and that such whiting cumulative limits would not be stackable (as part of an Alternative 2 transferable cumulative limit provision or as part of an Alternative 5 permit stacking system). For Alternative 2, whiting may be taken on both shoreside whiting and shoreside nonwhiting trips. Different types of whiting IFQ would be issued for the directed shoreside whiting trips and for incidental whiting catch on shoreside nonwhiting trips. Nonwhiting trips with incidental whiting catch would be constrained by year-round cumulative limits and whiting IFQ issued for nonwhiting trips would be required to cover the incidental catch. Directed shoreside whiting IFQ could not be used outside of the whiting season. Vessels which engage in both directed whiting and nonwhiting trips would have to use directed shoreside whiting IFQ for whiting targeted trips and use incidental whiting IFQ to cover incidental catch on nonwhiting trips. For Alternatives 2, 3, and 4, IFQ would still be required for whiting taken during closures, such that whiting catch would be constrained both by the IFQ requirement and cumulative limits. Also, when a vessel is making a whiting trip, nonwhiting catch taken on the trip would be limited to a single limit for each cumulative limit (Alternative 2) or permit stacked (Alternative 5) (i.e. even if a vessel stacks cumulative limits or permits for the purpose of making nonwhiting trips, while making whiting directed trips it would receive no credit for stacking).

Vessels with Limited Entry Trawl and Limited Entry Fixed Gear Permits

TASK: Provide guidance, if the proposed options are not acceptable.

The alternatives do not specify how catch taken by vessels with limited entry trawl and limited entry fixed gear permits will be treated. Options for consideration are provided under Element 3.2. These options include not requiring IFQ for fixed gear catch (Alternative 2), and not requiring IFQ for catch taken toward limited entry fixed gear cumulative or daily limits but allowing fixed gear catch in excess of such limits, if the catch is covered trawl with IFQs (Alternatives 3 and 4).

For the permit stacking alternative, two initial options are provided for consideration. The first applies the LE fixed gear rules any time a vessel is using fixed gear, the second applies the LE fixed gear rules when the vessel is fishing toward a sablefish tier limit but constrains the vessel to the trawl limits (including stacked limits) when it is not fishing toward the tier limit.

Limited Entry Trawl Vessels Using Open Access Under the Permit Stacking Alternative

TASK: Provide guidance, if the proposed options are not acceptable.

The permit stacking alternative does not specify how catch taken with open access gear (exempted gear longline and fishpot) will be managed. Two options for consideration are provided in Element 3.1. The first would be to continue to apply the open access trip limits. The second is to apply the LE trawl cumulative catch limits and permit stacking provisions along with a requirement that landings be made in compliance with the catch limit monitoring program (In Table 2-1, Element 3.1 and 3.2. In Table 2-3, Element 3.1, Options 3.1.4.1 and 3.1.4.2; and Element 3.2, Options 3.2.3.1 and 3.2.3.2).

Accumulation Caps for Transferable Cumulative Limits

TASK: Indicate whether or not there should be caps on stacking of transferable cumulative limits and if so the level of the caps that should be considered.

Under Alternative 2, species for which there is not a trawl allocation would be managed with transferable cumulative limits. For IFQs and permit stacking, caps have been specified for the amount of fish harvesting opportunity a person or vessel can accumulate. There is no cap specified with respect to the Alternative 2 transferable cumulative limits.

Rolling Over Unused Whiting IFQ Part Way Through the Season Under Alternative 2

TASK: Provide options for analysis.

Under status quo management a roll-over of unused allocation from one sector to another may occur if NMFS determines on September 15th that one sector's allocation is likely to go unused. Management regime Alternative 2 specifies that there be an option for a midseason rollover of IFQ from one sector to another. Two examples of how this might be achieved are provided in Sub-option 2.3.2.2 of Table 2-3. The first approach specifies that the IFQ ownership not change but rather the sector designation be lifted on some segment of the unused quota after a certain point in the year. The main issue under this approach may be that it could effectively eliminate the sector designations if individuals from one sector pay those in another sector not to use their quota so that it can be transferred between sectors toward the end of the year. The second approach specifies that unused IFQ be ceded back to the program for redistribution among other holders equally, via lottery or through other means. The main issue under this approach might be that individuals may apply to receive the redistribution not with the intent of using the redistribution but rather to acquire quota to sell.

Lengthening the Cumulative Limit Period Under Alternative 2

TASK: Provide guidance, if the proposed option is not acceptable.

Alternative 2 specifies that the cumulative limit periods might be lengthened but does not specify an option for the duration of the extension. The option for lengthening the cumulative period has tentatively been specified as a 4-month period, pending TIQC and Council review. The following outlines how management might function under a variety of limit period lengths.

Cumulative Limit Period	Function and Adjustment Under an Extended Cumulative Limit Period
1 year	The fishery would function either as an individual quota fishery in which each permit has one block of quota for each species/species group; or as a derby, if cumulative limits were set higher than the amounts that would constitute a quota.
6 months	The second 6-month period would function similar to the one-year period. Because complete data on the first period would not be available at the start of the second period, the second period would need to be started with low limits that would be increased after the results from the first six months are assessed. The adjustment for the second period could occur in late July (outside the Council meeting) or September (at the Council meeting). Excess catch of a single incidental species in the first period could severely limit opportunities in the second period.
4 months	The second period adjustment would have to occur after its start, therefore cumulative limits would likely need to start low then be increased after the assessment of the first period was complete. The second period adjustment could occur in late May (outside the Council meeting) or June (at the Council meeting). Alternatively, all adjustments could be made in the third period. The second period would end August 31 and the third period adjustment could be made at the September Council meeting. The third 4-month period would function similar to the one-year period.
3 months	A three-month period would require major reconfiguration of models and estimates from the observer program. It might function similar to the two-month cumulative limits, but would likely require either action outside of a Council meeting or mid-period adjustments.

NOTE: These scenarios assume cumulative limit periods of equal length. Other approaches could be constructed with periods of varying length, for example, the periods for a single year might run 4-months, 2-months, 4-months, 2-months.

Threshold for Triggering Low OY Management

TASK: Provide guidance, if the proposed option is not acceptable.

Under Alternative 3, whether or not low OY management would be imposed would be determined during the biennial management process. Under Alternative 2, a threshold would be established below which the switch to low OY management would be automatic. Under low OY management, catch for the low OY species would be controlled through nontransferable cumulative catch limits. (Under Alternative 2, low OY management would apply only to those species managed with transferable cumulative catch limits; under Alternative 3, low OY management would apply to any species managed with IFQ.).

For Alternative 2, only one threshold has been suggested, and that threshold is supplied as an example: "25% of B_{msy}"). Since no other thresholds have been put forward at this time, it is suggested that $B_{25\%}$ be specified as the threshold for the purpose of analysis.

IFQ Program Alternatives

The following table describes the design elements which vary between the IFQ program alternatives. Highlighted edits in the first row indicate the modifications proposed to streamline the analysis (with explanation provided in adjacent shaded area). Other shaded areas indicate provisions that may benefit from additional attention early in the second stage of developing the analysis.

Table. Differences between the IFQ programs, proposed revisions to the initial allocation of quota shares among eligible groups and other provisions which may benefit from some additional attention early in the analytical process.

Program A	Program B	Program C
Initial Allocation of Quota Shares, Section B.1.0		
Eligible Groups: 50% to current permit owners; 50% to processors.	*Eligible Group Suboption B-1:* 100% to current permit owners. ~~*Eligible Group Suboption B-2:*~~ ~~Nonwhiting--100% to current permit owners.~~ ~~Whiting--50% to current permit owners; 50% to processors.~~ ~~*Eligible Group Suboption B-3:*~~ ~~90% to current permit owners; 10% to processors.~~	*Eligible Groups:* 75% to current permit owners; ~~25% to processors.~~ with the remainder to be divided between processors and the community stability holdback (no less than 5% and no more than 20% to either group).
Programs A and B provide a range which, in combination with information from program C would allow the Council to select an IFQ allocation for processors of somewhere between 0% and 50%.	Suboption B-2 was an amalgam of Program A for the whiting fishery and Program B Suboption B-1 for the nonwhiting fishery. The description of the alternatives should identify that an option like Suboption B-2 is being considered. The analysis of the programs should adequately bracket the programs, providing the Council flexibility to adopt an option like Suboption B-2. Suboption B-3, a 10% processor allocation, is in Program C. The spread of allocations to permit holders (50% in Program A, 75% in Program C, and 100% in Program B) should adequately bracket an action in which 90% would go to permit holders.	For the analysis, use 10% to processors and 15% to communities. With this range of alternatives, the analysis should allow the Council to reasonably select options such as a 75/25 permit/processor split, a 75/25 permit/community-stability-holdback split, or a 90/10 permit/processor split.
Processor Definition: Use special IFQ program definition (processors: receive and process unprocessed fish; or catch and process).	*Processor Definition:* Use FMP definition (processors process unprocessed and already processed fish or receive live fish for resale).	*Processor Definition:* Same as Program B.
For June 2006: Issues relating to the definition of processor and qualifying processing history need to be addressed and are discussed in the text. The processors eligible to receive an initial allocation would not necessarily be those listed on the fish tickets. The primary concern is identification of the needed data for the initial allocation and analysis.		

Program A	Program B	Program C
Recent Participation Periods: Harvesters, including catcher processors--1998-2003. Shoreside Processors and Motherships--1999-2004.	*Recent Participation Option B-1:* None. *Recent Participation Option B-2:* 1998-2003.	*Recent Participation Periods:* Same as Program A.
For Fall 2006: The current recent participation requirements leave to the analysis the development of information that will be used to determine the level of activity required to meet the requirement (e.g. number of pounds or landings required to qualify as a recent participant. Information developed early in the second stage of the analysis may help the Council narrow the options, and thus facilitate a more efficient and focused analysis.		
Weighting Among Years: Use pounds from each year to calculate catch history.	*Weighting Among Years:* Use percent of total pounds for the year to calculate catch history for each year.	*Weighting Among Years:* Same as Program B.
For Fall 2006: The issue of weighting among years may be examined quantitatively. If the results of the analysis enable the Council to make a clear determination of preference in this area, it will be possible to efficiently produce a more focused analysis. For Fall 2006: Proxy Species. None of the current options include the possibility of using proxy species to allocate species for which it would have been desirable to minimize incidental catch, or for which the quality of catch history data is poor. Use of proxy species is, however, included in the list of options the Council may want to consider at time of final implementation. If there is a significant chance that the use of proxy species will be considered as part of the final action, it may be worthwhile to provide some preliminary analysis and consider inclusion of the option in one of the main program alternatives.		
IFQ/Permit Holding Requirements and IFQ Acquisition, Section B.2.0		
Rollover to Following Year: 10% for nonoverfished species and 5% for overfished species.	*Rollover to Following Year:* 30% for nonoverfished species and 30% for overfished species.	*Rollover to Following Year:* 5% for nonoverfished species and none for overfished species.
New entrant provisions: No special provisions.	*New entrant provisions:* No special provisions.	*New entrant provisions:* Lottery for new entrants to acquire revoked shares.
Community Stability Holdback: None.	*Community Stability Holdback:* None.	*Community Stability Holdback:* up to 20%.
Leasing: Allowed.	*Leasing:* Prohibited.	*Leasing:* Allowed.
Transfer Period: Year round	*Transfer Period:* January-October	*Transfer Period:* Year round
Accumulation Limits: 50% or none.	*Accumulation Limits:* Consider all limits as suboptions.	*Accumulation Limit Suboption C-1:* 1% or 5% *Accumulation Limit Suboption C-2:* 10% or 25%
For Fall 2006: The current range of accumulation limits is quite broad, even within the individual programs. Accumulation limits may have a significant influence on the long term effects of the IFQ program. Information on the distribution of catch history may allow the Council to narrow these limits.		
Program Administration, Section B.3.0		
Enforcement Program 2: 100% at-sea monitoring (observer), discards allowed. 100% shoreside monitoring. Upgraded bycatch reporting. Electronic state landings tracking system. Licenses required for delivery sites. Unlimited landing hours.	*Enforcement Program 1:* 100% at-sea monitoring (observer), full retention required. 100% shoreside monitoring. Electronic state landings tracking system. Limited ports of landing, no licenses required for delivery sites. Limited landing hours.	*Enforcement Program 3:* 100% at-sea monitoring (video or observer), discards allowed unless monitoring is with video cameras. Upgraded bycatch reporting. Federal electronic landings tracking system parallel to state system. Opportunity to monitor shoreside. Licenses required for delivery sites. Unlimited landing hours.
Central lien registry: Limited to necessary ownership information.	*Central lien registry:* With all ownership information.	*Central lien registry:* With all ownership information.
Cost Recovery: Up to 3%.	*Cost Recovery:* Up to 3%.	*Cost Recovery:* Full.
Data Collection: Expanded voluntary.	*Data Collection:* Expanded mandatory.	*Data Collection:* Expanded mandatory.

Restructuring

TASK: Provide guidance, if the proposed alternatives are not acceptable.

A proposal is made here to restructure the options with respect to the initial allocation of IFQ between harvesters, processors and community stability holdback. The restructuring is intended to simplify the analysis by providing clear sideboards (the Program A 50/50 split between permits and processors, and the Program B 100% allocation of IFQ to permit holders) and placing all the midpoints in Program C. Program C would allocate 75% to permit holders and 25% to be divided between processors and community stability holdback with no less than 5% and no more than 20% going to either. For the purpose of analysis, the Program C division would be 10% to processors and 15% to community stability holdback. This approach then brackets the options by providing analysis of 100%, 75%, and 50% to permit holders, 50%, 10% and 0% to processors, and 15% to community stability holdback. It should be reasonably possible to infer from these alternatives the effects of all mixes previously identified including providing 50% of the whiting IFQ and 0% of the nonwhiting IFQ to processors, and providing up to 20% of the IFQ for community stability holdback.

Note: also embodied in this revision is a modification of the description of the derivation of the community stability holdback. The holdback was previously specified as an annual withholding of quota pounds to be reallocated to cooperatives of IFQ holders coming forward with proposals that benefit communities. This modification would specify the holdback of quota shares rather than quota pounds. The approaches are mathematically equivalent. Specifying community stability holdback in the same section of the program as the initial permit/processor division of quota shares clarifies the eventual distribution of quota shares and pounds.

Specification of Design Elements

The main IFQ design element issue needing attention at this meeting is the definition of processor and the measures of processing history that would be used for an initial allocation of IFQ to processors. It may be possible to conduct analyses over the summer that would provide useful information on formulas for initial allocation (in particular, recent participation requirements, the measurement of catch history as annual proportions of total landings rather than pounds of total landings, and use of proxy species) and accumulation limits. Such information may help the Council ensure that the most relevant options are covered in the final analytical package and facilitate an efficient and focused analysis.

Processors and Processing History

TASK: Determine whether or not data sets have been identified that will be suitable to support an initial allocation to processors.

The IFQ programs include options for an initial allocation of IFQ to processors. After the initial allocation, the IFQ would be freely tradable, i.e. IFQ allocated to permit holders could be owned by processors or anyone else eligible to own IFQ, and IFQ allocated to processors could be owned by permit holders or anyone else eligible to own IFQ. For any allocation to proceed, there must be credible and verifiable documentation of the criteria on which the allocation will be based. In this case, the proposed criterion is processing history.

> "Processing or to process" means the preparation or packaging of groundfish to render it suitable for human consumption, retail sale, industrial uses, or long-term storage, including, but not limited to, cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, <u>but does not mean heading or gutting unless additional preparation is done</u>. [emphasis added]

Using this definition of processing, the TIQC identified two definitions for processor.

	Definition of Processor
Option 1	Using Special IQ Program Definition for Processors: The processor is the entity which - 1. after processing, sells his or her own LE trawl vessel-caught groundfish directly to a wholesale or retail market; OR 2. buys unprocessed trawl-caught groundfish, processes it, and sells it to the wholesale or retail market. The entity is defined as: Suboption 1(a)(i) the processing facility and allocation goes to the current owner, unless leased, in which case it would go to the current lessee. Suboption 1(a)(ii) the processing facility and allocation goes to the current owner. Suboption 1(b) the person processing (individual, partnership, corporation or other entity).
Option 2	FMP Definition. A processor is a- "person, vessel, or facility that engages in processing; or receives live groundfish directly from a fishing vessel for retail sale without further processing." Same suboptions for definition of entities as in Option 1.

In specifying the processing history on which the allocation should be based, the TIQC recommended that processors only receive credit for fish they process (fish passed through to another processor without processing should not be counted). The scoping document noted that information beyond what is on fish tickets will be needed to substantiate processing activities (fish tickets do not indicate whether or not the entity receiving the fish processed it and some processors may not be listed on a ticket for the fish they processed). Under the definitions of processing and processors, qualifying processing history could potentially accrue to the second, third or more handlers of the fish, including restaurants and grocery stores. (Note: the IFQ program prohibits IFQ ownership by any entity not eligible to own a US documented fishing vessel, therefore, foreign owned processors would not qualify for IFQ).

Status of entity as a processor based on the processor definitions.					
				Eligible for an Initial IFQ Allocation as Processor?	
Do they take ownership of the fish?	Is the fish received processed?	Does the entity process it?	Category	Option 1 Definition	Option 2 Definition
Yes	No	Yes	Processor (Including: Operations that Both Harvest and Process AND Operations that Acquire Unprocessed Fish from a Vessel/Receiver/Dealer/Buyer)	Yes	Yes
No	No	Yes	Custom Processor	No	Yes
No	No	No	Buyer	No	No
Yes	No	No	Fish Receiving-Station/Dealer	No	No
Yes	Yes	Yes	Secondary Processor	No	Yes
Yes	Yes	No	Fish Dealer/Wholesaler	No	No

To date we have not been able to identify the data set which would support an allocation to processors based on one of these definitions of processing history. On May 16, 2006, a letter was sent to processor representatives on Council advisory bodies explaining this problem and requesting their help in identifying data sets that could be used for an initial allocation and analysis. The TIQC will be addressing this issue at their June 11, 2006 meeting.

Allocation Formulas and Accumulation Limits

TASK: Schedule consideration for fall Council meeting.

Some additional preliminary analysis of allocation formulas and accumulation limits may enable the Council to narrow the some of the program options, thereby facilitating a more efficient and focused analysis. This work could be conducted and made available for the Council in the fall of 2006. Additional explanation of the issues is provided in shaded sections of the table displaying the differences among IFQ programs.

Table 2-1. Management Regime Alternatives for Analysis

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

Agenda Item F.3.a
Supplemental PowerPoint Presentation (Jim Seger)
June 2006

Table 2-1. Management Regime Alternatives for Analysis

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
	IFQ Program C	IFQ Program A IFQ Program B IFQ Program C	IFQ Program C	

Table 2-1. Management Regime Alternatives for Analysis

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
	IFQ Program C	IFQ Program A IFQ Program B IFQ Program C	IFQ Program C	

Table 2-2. IFQ Program Design Alternatives for Analysis

	IFQ Program A	IFQ Program B	IFQ Program C
.			
.	.		

Table 2-1. Management Regime Alternatives for Analysis

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
	IFQ Program C	IFQ Program A IFQ Program B IFQ Program C	IFQ Program C	

Table 2-2. IFQ Program Design Alternatives for Analysis

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.0 IFQ Allocation			
B.1.1 Eligible Groups	Permits/Processors 50/50	Permits/Processors B-1 100/0 B-2 90/10 B-3 50/50 for Whiting, Else 100/0	Permits/Processors 75/25

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
1. Status Quo	2. IFQ Program C	3. IFQ Program A 4. IFQ Program B (100/0) 5. IFQ Program B (90/10) 6. IFQ Program B (50/50 for Whiting, else 100/0) 7. Program C	8.IFQ Prog C	9. Stacking

Table 2-1. Management Regime Alternatives for Analysis

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl

COMPONENT 4. Monitoring and Enforcement (At-sea Observers/ Monitoring)

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl

COMPONENT 4. Monitoring and Enforcement (At-sea Observers/ Monitoring)

COMPONENT 5. Area Management

(Decision Table B from Scoping Results Document)

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl

COMPONENT 4. Monitoring and Enforcement (At-sea Observers/ Monitoring)

COMPONENT 5. Area Management
(Decision Table B from Scoping Results Document)

COMPONENT 6. Sector Allocation

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

Element 1.1 IFQ Program

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

Element 1.1 IFQ Program

Element 1.2 Permit Stacking

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

Element 1.1 IFQ Program

Element 1.2 Permit Stacking

Element 1.3 Cumulative Trip Limits

	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

Element 1.1 IFQ Program

Element 1.2 Permit Stacking

Element 1.3 Cumulative Trip Limits

Element 1.4 Adjustments for Low OYs

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 1: Catch Control Tools

Element 1.1 IFQ Program

Element 1.2 Permit Stacking

Element 1.3 Cumulative Trip Limits

Element 1.4 Adjustments for Low OYs

Element 1.5 General Season Closures

Element 1.6 Whiting Season Openings

Element 1.7 Whiting Season Closings

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

Element 2.1 Sectors

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

Element 2.1 Sectors

Element 2.2 Primary Trawl Target and Allocated Species <u>(Except Whiting)</u>

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

Element 2.1 Sectors

Element 2.2 Primary Trawl Target and Allocated Species <u>(Except Whiting)</u>

Element 2.3 Whiting

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

Element 2.1 Sectors

Element 2.2 Primary Trawl Target and Allocated Species (Except Whiting)

Element 2.3 Whiting

Element 2.4 Unallocated Shared Target and Incidental Species Currently Managed With Cumulative Limits

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 2 Sector/Species Group Combinations and the Catch Control Tools To Be Applied

Element 2.1 Sectors

Element 2.2 Primary Trawl Target and Allocated Species (Except Whiting)

Element 2.3 Whiting

Element 2.4 Unallocated Shared Target and Incidental Species

Element 2.5 "Other Fish" Groundfish

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl

Element 3.1 Trawl Vessel Using Exempted Gear

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl

Element 3.1 Trawl Vessels Using Exempted Gear

Element 3.2 Trawl Vessels Using Longline and Fish Pot, Without and With LE Endorsement

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 4. Monitoring and Enforcement (At-sea Observers/ Monitoring)

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 4. Monitoring and Enforcement (At-sea Observers/ Monitoring)

COMPONENT 5. Area Management (Decision Table B from Scoping Results Document)

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 4. Monitoring and Enforcement (At-sea Observers/ Monitoring)

COMPONENT 5. Area Management (Decision Table B from Scoping Results Document)

COMPONENT 6. Sector Allocation

Element 6.1 Within Trawl

(Among trawl sectors—Decision Table E)

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 4. Monitoring and Enforcement (At-sea Observers/ Monitoring)

COMPONENT 5. Area Management (Decision Table B from Scoping Results Document)

COMPONENT 6. Sector Allocation

Element 6.1 Within Trawl

(Among trawl sectors—Decision Table E)

Element 6.2 Trawl/All-Other-Gear

(Intersector Allocation Process—Separate EIS)

Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking

COMPONENT 4. Monitoring and Enforcement
(At-sea Observers/ Monitoring)

COMPONENT 5. Area Management
(Decision Table B from Scoping Results Document)

COMPONENT 6. Sector Allocation

Element 6.1 Within Trawl
(Among trawl sectors—Decision Table E)

Element 6.2 Trawl/All-Other-Gear
(Intersector Allocation Process—Separate EIS)

Element 6.3 Trawl/ Open Access
(Augment Open Access for Change in Species Accounting—Alternative 2)

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program					

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program					
Option 1.1.2 IFQ Program A					
Option 1.1.3 IFQ Program B					
Option 1.1.4 IFQ Program C					

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	N/A	N/A	N/A	☑
Option 1.1.2 IFQ Program A					
Option 1.1.3 IFQ Program B					
Option 1.1.4 IFQ Program C					

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	N/A	N/A	N/A	☑
Option 1.1.2 IFQ Program A	N/A	☐	☑	☐	N/A
Option 1.1.3 IFQ Program B					
Option 1.1.4 IFQ Program C					

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	N/A	N/A	N/A	☑
Option 1.1.2 IFQ Program A	N/A	☐	☑	☐	N/A
Option 1.1.3 IFQ Program B	N/A	☐	☑	☐	N/A
Option 1.1.4 IFQ Program C					

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	N/A	N/A	N/A	☑
Option 1.1.2 IFQ Program A	N/A	☐	☑	☐	N/A
Option 1.1.3 IFQ Program B	N/A	☐	☑	☐	N/A
Option 1.1.4 IFQ Program C	N/A	☑			N/A

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	N/A	N/A	N/A	☑
Option 1.1.2 IFQ Program A	N/A	☐	☑	☐	N/A
Option 1.1.3 IFQ Program B	N/A	☐	☑	☐	N/A
Option 1.1.4 IFQ Program C	N/A	☑	☑		N/A

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	N/A	N/A	N/A	☑
Option 1.1.2 IFQ Program A	N/A	☐	☑	☐	N/A
Option 1.1.3 IFQ Program B	N/A	☐	☑	☐	N/A
Option 1.1.4 IFQ Program C	N/A	☑	☑	☑	N/A

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	☐	☐	☐	☑
Option 1.1.2 IFQ Program A	N/A	☐	☑	☐	N/A
Option 1.1.3 IFQ Program B	N/A	☐	☑	☐	N/A
Option 1.1.4 IFQ Program C	N/A	☑	☑	☑	N/A
Element 1.2 Permit Stacking.					
Option 1.1.1 No Permit Stacking	☑	☑	☑	☑	☐

Table_2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1. Catch Control Tools					
Element 1.1 IFQ Program.					
Option 1.1.1 No IFQ Program	☑	☐	☐	☐	☑
Option 1.1.2 IFQ Program A	N/A	☐	☑	☐	N/A
Option 1.1.3 IFQ Program B	N/A	☐	☑	☐	N/A
Option 1.1.4 IFQ Program C	N/A	☑	☑	☑	N/A
Element 1.2 Permit Stacking.					
Option 1.1.1 No Permit Stacking	☑	☑	☑	☑	N/A
Option 1.1.2 Permit Stacking	☐	☐	☐	☐	☑

Staff Report
(F.3.a, Attachment 1)

In response to concerns about analytical effort required to address numerous alternatives and options; and identification of areas where more specificity is required

the staff report provides proposal to consider some adjustments to

- Management Regime Alternatives
- IFQ Program Alternatives

Management Regime Alternatives

- Simplify and eliminate one management regime alternative

11/05 Council
1. No Action
2. IFQ for Trawl Target
3. IFQ for Groundfish Except “Other” and Low OY Mngmnt
4. IFQ for Groundfish Except “Other” and No Low OY Mngmnt
5. IFQ for all Groundfish
6. Cumulative Catch Limits & Stacking

11/05 Council	**06/06 Proposed**
1. No Action	1. No Action
2. IFQ for Trawl Target	2. IFQ for Trawl Target
3. IFQ for Groundfish Except “Other” and Low OY Mngmnt	
4. IFQ for Groundfish Except “Other” and No Low OY Mngmnt	
5. IFQ for all Groundfish	4. IFQ for all Groundfish
6. Cumulative Catch Limits & Stacking	5. Cumulative Catch Limits & Stacikng

11/05 Council	**06/06 Proposed**
1. No Action	1. No Action
2. IFQ for Trawl Target	2. IFQ for Trawl Target
3. IFQ for Groundfish Except "Other" and Low OY Management	**3. IFQ for Groundfish Except "Other" (Option for Low OY Management)**
4. IFQ for Groundfish Except "Other" and No Low OY Management	
5. IFQ for all Groundfish	4. IFQ for all Groundfish
6. Cumulative Catch Limits & Stacking	5. Cumulative Catch Limits & Stacikng

06/05 Scoping	06/05 TIQC	06/05 Council	11/05 Council	06/06 Proposed
1. No Action	1. No Action	1. No Action	1. No Action	1. No Action
2. IFQ for Twl Target	2. IFQ for Twl Target	2. IFQ for Twl Target	2. IFQ for Twl Target	2. IFQ for Twl Target
3. IFQ for Groundfish Except "Other" (and Low OY Management)	**3. IFQ for Groundfish Except "Other" (and Low OY Mngmnt)**	**3. IFQ for Groundfish Except "Other" and Low OY Mngmnt**	**3. IFQ for Groundfish Except "Other" and Low OY Mngmnt**	**3. IFQ for Groundfish Except "Other" (Optoin for Low OY Mngmnt)**
	4. IFQ for Groundfish Except "Other and Halibut IBQ	**4. IFQ for Groundfish Except "Other" and No Low OY Mngmnt**	**4. IFQ for Groundfish Except "Other" and No Low OY Mngmnt**	
4. IFQ for all Groundfish and Halibut IBQ		5. IFQ for all Groundfish	5. IFQ for all Groundfish	4. IFQ for all Groundifsh
		6. IFQ for OF Species		
5. Cumul Catch Limits	5. Cumul Catch Limits			
6. Cumulative Catch Limits & Stckng	6. Cumulative Catch Limits & Stckng	7. Cumulative Catch Limits & Stckng	6. Cumulative Catch Limits & Stckng	5. Cumulative Catch Limits & Stckng
7. Cumul Catch Limits and Stacking with Extended Periods	7. Cumul Catch Limits and Stacking with Extended Periods			

Management Regime Alternatives

- Simplify and eliminate one alternative
- Whiting: better define closures, whiting & nonwhiting trips & stacking rules.

Whiting

- Shoreside Whiting Closure: Imposition of a cumulative catch limits (IFQ also required)
- Alternative 2: Shoreside Nonwhiting Trips
  - Incidental whiting IFQ year round cumulative catch limit and
- Alternative 2: Shoreside Whiting Closure
  - Directed whiting IFQ cannot be used outside whiting season
  - Whiting trip >50% whiting (TIQC recommendation)
- Permit and cumulative limit stacking does not apply for whiting trips

Management Regime Alternatives

- Simplify and eliminate one alternative
- Whiting: Better define closures, whiting & nonwhiting trips & stacking rules.
- Vessels with LE Trawl and LE Fixed Gear

LE Trawl & LE Fixed Gear

- IFQ not required for fixed gear catch
  - Alt 2: No opportunity to use IFQ with fixed gear
  - Alt 3 & 4: Allow vessels to use trawl IFQ when using fixed gear to catch in excess of fixed gear limits
- For permit stacking
  - Option a: No opportunity to benefit from stacked trawl limits (LE fixed gear rules apply)
  - Option b: Fixed gear limits apply while fishing toward sablefish tier limits. Otherwise, stacked trawl limits apply.

Management Regime Alternatives

- Simplify and eliminate one alternative
- Whiting: Better define closures, whiting & nonwhiting trips & stacking rules.
- Vessels with LE trawl and LE fixed gear
- LE trawl vessel use of open access gear under permit stacking.

LE Trawl & Open Access Gear (Permit Stacking)

- Option a: No opportunity to benefit from stacked trawl limits (open access trip limits apply)
- Option b: Stacked trawl limits apply.

Management Regime Alternatives

- Simplify and eliminate one alternative
- Whiting: Better define closures, whiting & nonwhiting trips & stacking rules.
- Vessels with LE trawl and LE fixed gear
- LE trawl vessel use of open access gear under permit stacking.
- Accumulation Limits for Transferable Cumulative Limits (Alt 2, unallocated spp)

Transferable Cumulative Limits (Unallocated Species Under Alternative 2)

- Option for a cap is needed
- Analysis to be provided and addressed at next TIQC meeting

Management Regime Alternatives

- Simplify and eliminate one alternative
- Whiting: Better define closures, whiting & nonwhiting trips & stacking rules.
- Vessels with LE trawl and LE fixed gear
- LE trawl vessel use of open access gear under permit stacking.
- Accumulation limits for transferable cumulative limits
- Rollover of unused whiting IFQ

Whiting IFQ Rollover

- Provision to allow such rollover needs more specificity.
- Development of more specific options to be addressed at next TIQC meeting

Management Regime Alternatives

- Simplify and eliminate one alternative
- Whiting: Better define closures, whiting & nonwhiting trips & stacking rules.
- Vessels with LE trawl and LE fixed gear
- LE trawl vessel use of open access gear under permit stacking.
- Accumulation limits for transferable cumulative limits
- Rollover of unused whiting IFQ
- Lengthening the cumulative limit period
- Threshold for low OY management

Threshold for Low OY Management (Alternative 2)

- Under Alternative 2 the low OY transition would be from transferable to nontransferable cumulative limits (for unallocated species)
  - $B_{25\%}$ was provided as the only example. Recommend changing status from “example” to the “provision” that would be used.
  - SSC has now proposed “overfished” status as the threshold.

- Under Alternative 3, the Council decides as part of each cycle whether a species should be managed using low OY management (transition from IFQs to cumulative limits).

Management Regime Alternatives

- Simplify and eliminate one alternative
- Whiting: Better define closures, whiting & nonwhiting trips & stacking rules.
- Vessels with LE trawl and LE fixed gear
- LE trawl vessel use of open access gear under permit stacking.
- Accumulation limits for transferable cumulative limits
- Rollover of unused whiting IFQ
- Lengthening the cumulative limit period

Alternative 2: Lengthening the Cumulative Limit Period

- No option had been provided
- Proposed option: 4 months

- Year round (derby or quota)
- 6 month (second period, derby or quota; adjustment procedure)
- 3 month (data systems not set up for odd number of months)

IFQ Program Alternatives

- Reducing Alternatives

Allocation splits for eligible groups (Progams A, B and C)			
	Current Options Permit/Proc Split		
Prog A	50/50		
Prog B	100/0		
Prog B	90/10		
Prog B	100/0 nonwhtg 50/50 whtg		
Prog C	75/25 (up to 20% pounds CSH)		

Allocation splits for eligible groups (Progams A, B and C)			
	Current Options Permit/Proc Split	Options from Staff Report Permit/Proc Split	
Prog A	50/50	50/50	
Prog B	100/0	100/0	
Prog B	90/10		
Prog B	100/0 nonwhtg 50/50 whtg		
Prog C	75/25 (up to 20% pounds CSH)	75/10/15 (permit/proc/CSH)	

Allocation splits for eligible groups (Progams A, B and C)			
	Current Options Permit/Proc Split	Options from Staff Report Permit/Proc Split	TIQC Options Permit/Proc Split
Prog A	50/50	50/50	50/50
Prog B	100/0	100/0	100/0
Prog B	90/10		
Prog B	100/0 nonwhtg 50/50 whtg		
Prog C	75/25 (up to 20% pounds CSH)	75/10/15 (25%) (permit/proc/CSH)	75/25 (20% pounds CSH, Council mgmt choice)

Allocation splits for eligible groups (Progams A, B and C)			
	Current Options Permit/Proc Split		
Prog A	50/50		
Prog B	100/0		
Prog B	90/10		
Prog B	100/0 nonwhtg 50/50 whtg		
Prog C	75/25 (up to 20% pounds CSH)		

Allocation splits for eligible groups (Progams A, B and C)			
	Current Options Permit/Proc Split		TIQC Options Permit/Proc Split
Prog A	50/50		50/50
Prog B	100/0		100/0
Prog B	90/10		
Prog B	100/0 nonwhtg 50/50 whtg		
Prog C	75/25 (up to 20% pounds CSH)		75/25 (20% pounds CSH, Council mgmt choice)

IFQ Program Alternatives

- Reducing Alternatives
- Specification of Elements
  - Processors and Processing History Definition

Processor & Processing Definitions

- Two definition options
  - Under either option processors deep into the marketing chain could qualify
  - Lack of data to implement or analyze
- TIQC proposal to resolve these issues and narrow the definition to one option
- Options remaining:
  - (1) the facility qualifies the current . . .
    - (suboptions owner or lessee),
  - (2) the person owning the facility at the time of processing qualifies

IFQ Program Alternatives

- Reducing Alternatives
- Specification of Elements
  - Processors and Processing History Definition
  - For Fall 2006
    - Recent participation options
    - Weighting among years
    - Use of target species as proxies for incidental
    - Accumulation caps

Agenda Item F.3.b
Attachment 1 ERRATA (Complete)
June, 2006

ERRATA: Replacement Pages 23-36 for
Excerpt from Stage 1 Draft IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery (Chapters 1, 2, 4 and Appendices A-C).

Attached is a revised Table 2-1 (from Agenda Item F.3.b, Attachment 1). The pages immediately preceding and following the table are included to facilitate replacement of the original Table 2-1 with the errata table. The main differences between this and the original version are in the references to the whiting and non-whiting species and segments of the fishery.

PFMC
06/09/06

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Alternative 4: IFQs for all groundfish species. The distinction between whiting sectors would be eliminated. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. OYs for each of the Other Species of groundfish would be would be established. If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species.

Alternative 5: **Permit stacking.** Groundfish would be managed as under the No-Action Alternative, but limited entry trawl permit holders would be allowed to "stack" additional permits. Permit holders would be issued a full complement cumulative trip limit pounds for each permit they own. Whiting seasons and sectors would be maintained. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. Catches of Other Species would be monitored. If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species.

In addition to the various management regimes described above, the three IFQ alternatives (Alternatives 2 – 4) differ with respect to the way in which quota shares are allocated. The Council developed three basic allocations and incorporated them into three IFQ programs (currently labeled Program A, Program B, and Program C). The allocations differ primarily in terms of which groups would receive quota and how much each group would receive. These are summarized below:

Program A: Harvesters and processors are initially allocated equal amounts of QS that give them rights to harvest groundfish. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. Program A would be applied to Alternative 3.

Program B: Harvesters and processors are allocated QS that give them rights to harvest groundfish. Split options include: a) 100/0 for all groundfish, b) 100/0 for non-whiting and 50/50 for whiting, and c) 90/10 for all groundfish. Processors are defined as in the FMP—those facilities that process either unprocessed or already processed groundfish or receive live fish for resale. Program B would be applied to Alternative 3.

Program C: Harvesters and processors are allocated QS that give them rights to harvest groundfish. Harvesters would initially receive 75 percent of the QS and processors would receive the remaining 25 percent. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. Program C would be applied to Alternative 2, 3, and 4.

All three of the programs are applied to Alternative 3 as options. In effect, this generates three new alternatives: Alternatives 3A, 3B, and 3C. In addition it should be noted that Program B contains three different allocation schemes, and that these schemes also have the potential to significantly alter the impacts of the alternative. The end result is that Alternative 3 might reasonably be analyzed as five different alternatives: Alternatives 3A, 3Ba, 3Bb, 3Bc, and 3C.

Table 2-1 and Table 2-2, below, present details of the various elements and options that make up each of the alternatives. The tables are similar to those produced for the Council, and contain references to the IFQ Scoping Results Document[6] and various options described within that document.

[6] National Environmental Policy Act Scoping Results Document: Individual Fishing Quotas (A Kind of Dedicated Access Privilege) and Other Catch Control Tools for the Pacific Coast Limited Entry Trawl Groundfish Fishery. Pacific Fishery Management Council, July 2005.

Table 2-1. Management Regime Alternatives for Analysis

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
COMPONENT 1: CATCH CONTROL TOOLS					
IFQ Program for Non-Whiting and Whiting Trips					
Element 1.1 IFQ Program to Be Applied **(See Table 2-2)**	No IFQ Program.	Program C	Alternative 3A - Program A Alternative 3B - Program B Alternative 3C - Program C	Program C	No IFQ Program.
Additional Control Tools (Sections 2.1.1.2 of the Scoping Results Document).[a]/					
Element 1.2 **Permit Stacking**	-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- None -- -- -- -- -- -- -- -- -- -- -- -- -- -- --				One set of trip limits issued for each of a maximum of 3 permits attached to vessel. Only one of the permits attached to the vessel would need to be of the appropriate length.
Element 1.3 **Cumulative Trip Limits**	Cumulative landing limits. (One set of limits for each vessel to which a permit is assigned.)	Transferable cumulative catch limits.[b]/ Cumulative limits would be transferable on a temporary basis between vessels within the period (full or partial limit transfers would be allowed, depending on length of limit period)	Cumulative catch limits (One set of limits for each vessel to which a permit is assigned.)	None	Cumulative catch limits. (One set of limits for each permit.)

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 1.4 Adjustments for Low OYs					
Allocation	- -- -- -- -- -- -- -- -- The Council may suspend intersector allocations when a species is overfished -- -- -- -- -- -- -- --				
Catch Control Rules	N/A	Adjust rules for low OY conditions (as specified in Component 2). *IFQ species – No change.* *Non-IFQ species – For species meeting the low OY threshold switch from transferable to* ***non****transferable cumulative catch limits.*[c/]	**Option 1**: Adjust rules for low OY conditions (as specified in Component 2). *For low OY species, except whiting, switch from IFQs for that species and instead manage the sector allocation as a pool using nontransferable cumulative catch limits to control catch.*[d/] **Option 2:** No low OY adjustments.	N/A	N/A
Threshold	N/A	Low OY Threshold: Establish a threshold at which point a species would switch to "Low OY management." ($B_{25\%}$)	Low OY Threshold: Decide on application of "Low OY management" as part of the biennial specifications process.	N/A	N/A
Element 1.5 General Season Closures	-- -- -- -- When all sectors in aggregate reach the overall OY for a species, seasons close for the affected species -- -- -- --				
Element 1.6 Whiting Season Openings	Staggered season openings for each whiting sector.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Same as no action.
Element 1.7 Whiting Season Closings	Whiting season closes for a sector on attainment of whiting allocation. Whiting season closure on attainment of bycatch caps for species with bycatch caps.	Whiting season closure on attainment of bycatch caps for species with bycatch caps.[i/]	Open until end of year.	Open until end of year.	Same as no action

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
COMPONENT 2					
Sector/Species Group Combinations and the Catch Control Tools To Be Applied (Section 2.1.1.3 & 2.1.1.4 of the scoping results document)					
Element 2.1 Sectors Define Whiting Trip: Opt 1-- >50% non-whiting Opt 2-- >50% or >10,000 lbs non-whiting	Three sectors: ▪ shoreside (SS) deliveries ▪ mothership (MS) deliveries ▪ catcher-processor (CP) deliveries	Four sectors: ▪ SS whiting deliveries ▪ SS non-whiting deliveries ▪ MS deliveries ▪ CP deliveries (FROM Scoping Results Doc: 2.1.1.4 Option 3)	Three sectors: ▪ SS deliveries ▪ MS deliveries ▪ CP deliveries (FROM Scoping Results Doc: 2.1.1.4 Option 2)	One sector (FROM Scoping Results Doc: 2.1.1.4 Option 1)	Three sectors: ▪ SS deliveries ▪ MS deliveries ▪ CP deliveries
Element 2.2 Primary Trawl Target and Allocated Species[e/] **(Except Whiting)**	All sectors: cumulative landing limits. Trawl fishery closes on attainment of cap, guideline or OY. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species.	SS non-whiting deliveries: IFQs SS, MS, & CP whiting deliveries: catch caps for these species. A sector's whiting seasons close on attainment of that sector's whiting fishery catch cap for non-whiting species. No cumulative catch limits. Midseason rollovers for excess cap amounts and augmentation of caps thru acquisition of SS IFQ.	Sector specific IFQs (Low OY Conditions: Option 1: switch to nontransferable cumulative catch limits and close on attainment of sector limits; Option 2: continue use of IFQs.)	IFQ	Cumulative catch limits with permit stacking rules applied for non-whiting trips. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species. Stacked permits may not be used to cover catch on whiting trips.
Element 2.3 Whiting	All sectors: Whiting season (no vessel landing limits). Outside the whiting season shoreside deliveries allowed under cumulative whiting landing limits. Midseason rollover of excess allocation to another sector.	SS nonwhiting deliveries: Whiting catch must be covered with IFQ and is also constrained year-round by nontransferable cumulative whiting catch limits. SS, MS, & CP whiting deliveries: IFQs during whiting season. Midseason whiting rollover to another sector Opt 1: Not allowed; Opt 2: Allowed following specified procedures.	Sector specific IFQs during the whiting season. If SS whiting is closed SS whiting IFQs may continue to be used, subject to nontransferable cumulative whiting catch limits.	IFQs during the whiting season. IFQs and nontransferable cumulative whiting catch limits for shoreside deliveries outside the whiting season.	All sectors: Whiting season (no vessel landing limits). Outside the whiting season shoreside deliveries allowed under cumulative whiting catch limits. Permit stacking rules do <u>not</u> apply for cumulative whiting limits. Midseason rollover of excess allocation to another sector.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 2.4 Unallocated Shared Target and Incidental Species Currently Managed With Cumulative Limits	All sectors: cumulative landing limits Trawl fishery closes on attainment of cap, guideline or OY. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species.	SS whiting deliveries Transferable cumulative catch limits. Option for >2 mo cumulative periods and midperiod transfers. (Low OY conditions: switch to nontransferable cumulative catch limits) SS, MS, & CP whiting deliveries For species without caps: non-whiting species catch is limited by to a single cumulative catch limits regardless of the number of transferable limits held by a vessel. For non-whiting species with caps, same as Element 2.2.	Sector specific IFQs. (Low OY Conditions: Same low OY condition options as for "Primary Trawl Target and Allocated Species" (Element 2.2))	IFQ	Cumulative catch limits with permit stacking rules applied for non-whiting trips. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species. Stacked permits may not be used to cover catch on whiting trips.
Element 2.5 "Other Fish" Groundfish[f/g/]	Status Quo. Currently: monitoring only. May change to cumulative limits.	Same as status quo.[h/]	Same as status quo.[h/]	IFQ	Same as status quo.[h/]
Component 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Section 2.1.1.5 of the Scoping Results Document)					
Element 3.1 **Trawl Vessel Exempted Gear Quota Accounting and Catch Control (Includes Exempted Trawl and Exempted Non-trawl Gears)**	**Exempted gea**r catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[i/] but is subject to open access (OA) trip limits.	**Exempted gear** - IFQ is **not** required. Catch counts against the OA allocation and is managed as part of the OA fishery. Some catch will be allocated from the LE trawl to OA fishery. (FROM Scoping Results Document Section 2.1.1.5 Opt 2C)	**Exempted gear -** IFQ required. Catch counts against LE Trawl. Open access catch control regulations apply. (FROM 2.1.1.5 Scoping Results Document Section Option 1A)	**Exempted gear -** IFQ required. Catch counts against LE Trawl. Open access trip limits **do not** apply. (FRM 2.1.1.5 Scoping Results Doc Option 1B)	**Exempted gea**r catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[h/] but is subject to open access (OA) trip limits OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 3.2 **Trawl Vessel Longline and Fish Pot Without and With LE Endorsement (Fixed Gear Quota Accounting and Catch Control)**	**Unendorsed longline & fishpot** catch by LE trawl vessels counts against LE allocation (trawl and fixed gear) [i/] but is subject to open access trip limits. **LE endorsed fixed gear** - Rules for the LE fixed gear fishery apply when the vessel is using fixed gear. Vessels fish against the limited entry allocation[i/] and are constrained by fixed gear trip limits while using fixed gear.	**Unendorsed longline & fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed gear catch control regulations apply. **LE endorsed fixed gear –** While using fixed gear, IFQ is not required, catch is constrained by LE fixed gear limits and counts toward the LE fixed gear allocation. (FROM 2.1.1.5 Scoping Results Doc, Option 1A)	**Unendorsed longline and fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed catch control regulations **do not** apply. **LE endorsed fixed gear –** While using fixed gear, IFQ is not required for catch taken toward LE fixed gear cumulative or daily limits and such catch counts toward the LE fixed gear allocation. Catch in excess of LE fixed gear trip limits may be taken if covered by trawl IFQ. (FROM 2.1.1.5 Scoping Results Doc, Opt 1B)	**Unendorsed longline & fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed catch control regulations **do not** apply. **LE endorsed fixed gear** - While using fixed gear, IFQ is not required for catch taken toward LE fixed gear cumulative or daily limits and such catch counts toward the LE fixed gear allocation. Catch in excess of LE fixed gear trip limits may be taken if covered by trawl IFQ. (FRM 2.1.1.5 Scoping Results Doc, Opt 1B)	**Unendorsed longline & fishpot** catch by LE trawl vessels counts against LE allocation[i/] (trawl and fixed gear) [i/] but is subject to open access trip limits. OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions. **LE endorsed fixed gear** - When the vessel is using fixed gear catch counts against the LE allocation[i/] and is constrained by fixed gear limits. OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions (except when fishing fixed gear tier limits).
Component 4. Monitoring and Enforcement					
At-sea Observers/ Monitoring	Biological observers on some SS catcher vessel trips, 100% observers for at-sea deliveries (MS and CP)	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4).	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4)	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4)	100% at-sea monitoring.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Component 5. Area Management (Decision Table B from Scoping Results Document)					
	Species divided by areas based on stock assessment information. New area divisions created as stock assessment information indicates need.	Program Option for All Action Alternatives: Plan to establish additional regional management areas as needed at a later time. Provisions are included to allow later subdivision of IFQs by area. Process Option: Task a group to begin considering the need for additional regional management areas (biological or socio-economic) and potential boundaries along with a process for identifying and responding to regional management area issues that may develop or become more apparent in the future. **Decision deferred until additional information is available, e.g. preliminary DEIS is ready.**			
Component 6. Sector Allocation					
Element 6.1 Within Trawl (Decision Table E from Scoping Results Document)	Whiting allocation rules. No other within trawl allocations.	Establish within trawl allocations based on each sector's relative shares during the time period used for initial allocation. If time periods are different for different sectors use only those years in common to all sectors or calculate a percentage based on each sectors period then adjust all sectors proportionally so that the result sums to 100%. Consider applying the IFQ allocation recency requirement (if any) to eliminate from the sector calculation the catch history of any vessel that has not been active in recent years.			Whiting allocation rules. No other within trawl allocations.
Element 6.2 Trawl/All-Other-Gear		Establish needed intersector allocations through the intersector allocation process.			
Element 6.3 Trawl/ Open Access	N/A	Augment the open access allocation to account for trawl vessels fishing with open access gear on the open access allocation (Element 3.1)	N/A	N/A	N/A

Table 2-2. IFQ Program Design Alternatives for Analysis

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.0 IFQ Allocation			
B.1.1 Eligible Groups	Allocate 50% of quota shares to current permit owners and 50% to processors (Option 3b).[7]	Eligible Group Suboption B-1. Allocate 100% of quota shares to current permit owners (Option 1 from Appendix B). Eligible Group Suboption B-2. Allocate 100% of quota shares for non-whiting species to current permit owners and 50% of the quota shares for whiting species to current permit owners. Allocate 50% of the quota shares for whiting species to processors. (New Option, June 2005) Eligible Group Suboption B-3. 90% of quota shares to current permit owners and 10% to processors. (New Option, June 2005).	Allocate 75% of quota shares to current permit owners and 25% to processors (Option 3a).
Processor Definition:	Use special IFQ Program definition (processors: receive and process unprocessed fish; or catch and process) (Option 1).	Use FMP Definition (processors process unprocessed and already processed fish or receive live fish for resale) (Option 2).	Same as Program A.

[7] References to Options refer to options at they were described in the Scoping Results Document, i.e. *National Environmental Policy Act Scoping Results Document: Individual Fishing Quotas (A Kind of Dedicated Access Privilege) and Other Catch Control Tools for the Pacific Coast Limited Entry Trawl Groundfish Fishery*. Pacific Fishery Management Council, July 2005.

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.2 Qualifying Criteria: Recent Participation	**Harvesters (including catcher-processors):** 1998-2003 participation required in order to qualify for an initial allocation of quota shares (number of trips or years to be specified). (Option 2). **For shoreside processors and motherships:** 1999-2004 recent participation requirement (the number of trips or years is yet to be specified). (Option 4).	All Members of Eligible Groups: No recent participation required in order to qualify for an initial allocation of quota shares (Option 1). **OR** All Members of Eligible Groups: 1998-2003 participation required (one trawl groundfish landing/delivery of any groundfish species) in order to qualify for an initial allocation of quota shares. (Option 2).	Same as Program A.
B.1.3 Elements of the Allocation "Formula"			
Vessel/Permit Related Allocation	Catcher vessel permit owners will receive quota shares based on their permit history plus an equal division of the quota that could be attributed to permit history of bought-back permits (catcher-processors permit owners will not receive a portion of the quota shares distributed on an equal sharing basis) (Option 2). Suboptions for incidentally caught overfished species, either: (a) same as for Other Fish OR (b) equally divide quota for incidentally caught overfished species. For catcher-processors permit owners, use an allocation schedule developed by unanimous consent of that sector (to be provided).	Same as Program A, except no special catcher-processor schedule.	Same as Program A.
Processor Allocation	Processors are allocated quota shares based entirely on the processing of groundfish trawl landings received unprocessed (Option 1).		
B.1.4 History: Species/Species Groups to Be Used for Allocation	Allocate Quota Shares Based on Individual Species/Species Groups: Allocate quota shares for each species/species group based on relative amounts of each respective species/species group caught/landed or processed - for permits applies to permit history; for processors applies to amounts processed (Option 2).		

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.5 History: Allocation Periods			
Periods/Years to Drop:	Options are identical under all programs. Vessels: 1994-2003. Drop 2 years for whiting sector fishing (applies to incidental harvest and whiting). Drop 3 years for non-whiting sector fishing. (Option 1, Sub-option B) Shore Processors: 1999-2004. Drop 2 years. (Option 5, Sub-option B) Motherships: 1998-2003. No opportunity to drop worst year. (Option 4, Sub-option A)		
Weighting Among Years:	Absolute pounds - no weighting between years (Sub-option (i)).	Relative pounds (calculate history based on the entity's percent share of each year's total) (Sub-option (ii)).	Same as Program B
B.1.6 History: Combined Permits and Other Exceptional Situations			
Combined permits:	All permits count. History of the permits combined into a single permit goes to the resulting permit (Option 1).		
Illegal landings/catch:	Don't count Illegal landings/catch under any program.		
Landings in excess of trip limits, as authorized under an EFP:	Don't count landings in excess of the cumulative limit in place for the non-EFP fishery under any program		
Compensation fish:	Don't count compensation fish under any program.		
B.1.7 Initial Issuance Appeals Process	Only one provision has been identified: Appeals would occur through processes developed by NMFS. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Any proposed revisions to fish-tickets would undergo review by state enforcement personnel prior to finalization of the revisions.		
B.1.8 Creating New IFQ Species/Species Groups After initial Implementation	Only one practical option has been identified: When a management unit is subdivided, quota shares for that unit will be subdivided by issuing quota share holders amounts of shares for the subdivisions equivalent to their holdings of the shares being subdivided. If a new management unit is established that is not a subset of an existing unit managed with IFQ, the Council will need to take action at that time to develop criteria for quota share allocation.		
B.2.0 IFQ/Permit Holding Requirements and IFQ Acquisition (After Initial Allocation)			
B.2.1 IFQ and LE Permit Holding Requirements	Catch must be covered with quota pounds within 30 days of the landing (Option 3). Only LE trawl vessels would be allowed to participate in the IFQ fishery. For any vessel with an overage (landings not covered by quota) there would be no more fishing by the vessel until the overage is covered. Additionally, for vessels with an overage, the limited entry permit cannot be sold or transferred until the deficit is cleared. A possible suboption would require some amount of quota pounds be held prior to departure from port (to be analyzed).		
B.2.2 Annual IFQ Issuance			
B.2.2.1 Start-of-Year Quota Pound Issuance	Only one practical option has been identified: Quota pounds are issued annually to share holders based on the amount of quota shares they held. (Quota shares are issued at the time of initial IFQ allocation).		

	IFQ Program A	IFQ Program B	IFQ Program C
B.2.2.2 Rollover (Carryover) of Quota Pounds to a Following Year			
Non-overfished Species	10% rollover for non-overfished species (Option 3)	30% rollover for non-overfished species (Option 5)	5% rollover for non-overfished species (Option 2)
Overfished Species	5% rollover for overfished species (Option 3)	Full (30%) rollover allowance for overfished species (Option 5)	No rollover allowance for overfished species (Option 2)
B.2.2.3 Quota Share Use-or-Lose Provisions	Do not include a use-or-lose provision but evaluate need as part of future program reviews (Option 3).		
B.2.2.4 Entry Level Opportunities for Acquiring Quota Shares and Low Interest Loan Options	No special provisions.	No special provisions.	Provide new entrants an opportunity to qualify for revoked shares and shares lost due to non-use (if such non-use provisions are created) (Element 2)
B.2.2.5 Community Stability Hold Back	No special provisions.	No special provisions.	Set aside up to 20% of the non-whiting shoreside trawl sector allocation each year and allocate to IFQ holders who have submitted proposals, ranked on the basis of objective criteria that evaluate benefits to local communities.
B.2.3 Transfer Rules			
B.2.3.1 Eligible Owners/Holders (Who May Own/Hold)	Any entity eligible to own or operate a US documented fishing vessel. (Option 2) *The Trawl IQ Committee's intent is to preserve opportunity for existing participants*		
B.2.3.2 Duration of Transfer - Leasing and Sale	Permanent transfers and leasing of quota shares and quota pounds allowed. (Option 2)	Permanent quota share transfers only--leasing prohibited. Permanent transfers and leasing of quota pounds allowed. (Option 1)	Same as Program A
B.2.3.3 Limits on Time of Transfer	Allow transfers of quota shares any time during year (Option 1).	Prohibit transfer of quota shares during the last two months of the year.	Same as Program A
B.2.3.4 Divisibility	Only one practical option has been identified: Quota Shares: nearly unrestricted divisibility - "many decimal points." Quota Pounds: divisible to the single pound		
B.2.3.5 Liens	No options have been proposed to restrict liens. Liens can and should be facilitated through a central lien registry. Options for the central lien registry are covered in Section B.3.1.		

	IFQ Program A	IFQ Program B	IFQ Program C
B.2.3.6 Accumulation Limits	50% or No Limits (Option 5).	Consider all limits as sub-options	Most restrictive limits (1% or 5%) **OR** Intermediate level limits (10% or 25%)
B.2.3.7 Vertical Integration Limit	Only one option has been identified: No additional limits on vertical integration beyond those already provided through accumulation limits.		
B.3.0 Program Administration			
Tracking IFQ, Monitoring Landings, and Enforcement (see Table B.3-1)			
Enforcement Program Number	**Enforcement Program 2**	**Enforcement Program 1**	**Enforcement Program 3**
At-Sea Monitoring	100% at-sea monitors (observers)	100% at-sea monitors (observers)	100% at-sea monitors (observers) or cameras
Shoreside Monitoring	Shoreside monitoring opportunity would be provided	100% shoreside monitoring	Shoreside monitoring opportunity would be provided
Retention and Discards	Discards allowed	Full retention required	Discards allowed if at-sea monitor is present (otherwise full retention)
Discard Monitoring and Reporting System	Upgraded discard (bycatch) monitoring and reporting system needed	An upgraded discard monitoring and reporting system is un-needed	Upgraded discard (bycatch) monitoring and reporting system needed
Electronic Reporting	Electronic landings tracking. QS reported electronically.	Electronic landings tracking. QS reported electronically.	Parallel federal electronic landings tracking. QS reported electronically.
Landing Notification	Advance notice of landing required.	Advance notice of landing required	Advance notice of landing required
Potential Landing Times	Unlimited landing hours	Limited landing hours	Unlimited landing hours
Potential Landing Sites	Licenses required for delivery sites	Unlimited landings sites	Licenses required for delivery sites
Vessel Monitoring System (VMS)	VMS Required under all programs	VMS Required under all programs	VMS Required under all programs
Quota Share Tracking	Create a central lien registry but exclude all but essential ownership information. (Option 2).	Create a central lien registry including all related ownership information (Option 1).	Create a central lien registry including all related ownership information (Option 1).

	IFQ Program A	IFQ Program B	IFQ Program C
B.3.2 Cost Recovery/Sharing and Rent Extraction	Cost recovery for management (not enforcement or science). Up to 3% of ex-vessel value, the limit specified in the Magnuson-Stevens Act.	Same as Program A	Full cost recovery: Landings fee plus privatization of elements of the management system. In particular, privatization for monitoring of IFQ landings (e.g., industry pays for their own compliance monitors). Stock assessments should not be privatized and the electronic fish ticket system should not be privatized.
B.3.3 Program Duration and Procedures for Program Performance Monitoring, Review, and Revision (Magnuson-Stevens Act (d)(5)(A))	A four year review process is specified along with review criteria. Among other factors, the review would include evaluation of whether or not there are localized depletion problems and whether or not quota shares are being utilized. Standard fishery management plan and regulatory amendment procedures will be used to modify the program.		
B.3.4 Data Collection	Expanded voluntary submission of economic data (Option 2).	Expanded mandatory submission of economic data (Option 1).	Same as Program B

2.2 Alternatives Considered but Excluded from Detailed Analysis

This section discusses an alternative that was considered but rejected and briefly explains the reasons for its elimination. In addition, this section lists options and sub-options that were considered by the Council and TIQC but were not included in any of the alternatives forwarded for analysis.

An alternative that was initially considered for analysis would issue IFQs for overfished species, maintain cumulative trip limits for all other species, and implement total catch reporting and 100 percent at-sea monitoring. Upon further consideration it was determined that this alternative would not have the potential to create enough benefits to the groundfish fishery to offset the costs of the monitoring and reporting requirements, and questions were raised as to how the program would continue once overfished species recovered. Therefore, the alternative was dropped from further consideration.

In addition to the dropped alternative, a number of options and sub-options were discussed by the Council and TIQC but not included in the alternatives forwarded for analysis. The list below provides an initial summary of these excluded elements and options.

- Species groups that could be managed under an IFQ program but were not explicitly included
    - Overfished Species
    - Prohibited Species
- Stakeholder groups that were not included as recipients of QS
    - Vessel crew members and skippers
    - Vessel owners
    - Communities
- Methods for issuing QS that were not included
    - Auctions
    - Lotteries
    - Equal shares
    - QS based strictly on years of participation
- Types of shares from an IFQ program that might have been forwarded but were not
    - Shares for Processing (as opposed to IFQs for harvesting issued to processors)

While the elements and options listed above were not specifically included in the suite of alternatives that were forwarded for full analysis, all are included in the description of components, elements and options (Section 2.3).

2.3 Components Table

Before the effects of the alternatives on resources and stakeholders of concern can be fully evaluated a number of issues need to be addressed and decisions may need to be made by the Council. The Components Table below highlights these issues by augmenting the basic alternatives forwarded by the Council for detailed analysis. The major goal of the Components Table and the Components Analysis (see Appendix C: Components Analysis) is to ensure that the details of each alternative are adequately considered by clearly specifying how the different elements fit together within an alternative and identifying unknown or unintended potential effects on resources and stakeholders groups. The Components Table and Components Analysis also identify options that were discussed but not brought forward for detailed analysis.

See Errata for Table 2-1 (Click Here)

Stage 1 Draft

IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery

Council Review Draft

Stage 1 Document in the Development of an Environmental Impact Statement/ Regulatory Impact Review/ Social Impact Analysis/ Initial Regulatory Flexibility Analysis

Prepared for the

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Preface

This document is the Stage I Draft of the *Environment Impact Statement (EIS) of IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery* produced under Contract No. PFMC01IQ02 with the Pacific Fishery Management Council.

This version of the document has been completely reorganized from the draft that was provided in April to the Trawl IFQ Workshop. The reorganization decision was in collaboration with the PFMC. The document should be viewed as a work in progress, and as such the Consulting Team has focused its effort on document content, rather than on formatting. We apologize for any inconvenience this may cause reviewers, and very much appreciate any editing and proofreading comments.

The document is currently over 350 pages long including this front material, and while significant portions of the document contain only section headings, reviewers are encouraged to examine the entire document and to provide comments on the overall structure of the outline.

The Consulting Team has tried to front-load the content of the outline. The bulleted list provides an overview of the various chapters along with an indication of content levels.

- Chapter 1 contains introductory text for the EIS. The content is relatively complete.
- Chapter 2 provide summary of the alternatives for analysis. The Council has forwarded a main suite of 5 Alternatives including the No-Action Alternative. In addition there are numerous options that are also included but which are not part of the main suite of alternatives. The Council has not rejected these options and therefore wishes to include them in the EIS. The Components Table, shown in the second half of Chapter 2, organizes the alternatives forwarded by the Council in a step-by-step manner that allows decision-makers and stakeholders to investigate and understand the ramifications of each of the little decisions that must be made when overhauling the management regime. The PFMC and the Consulting Team are in the process of revising earlier versions of the component table, and consequently the full table is unavailable at this time. The full table will be included in the final draft.
- Chapter 3 contains the annotated outline of the past and baseline conditions of the affected stakeholders and resource groups.
- Chapter 4 contains annotated outline of the direct, indirect, and cumulative effects analysis. In the effects analysis of the alternatives will be examined as whole, and the effects of the alternatives on each group of stakeholders and resources will be documented.
- Chapter 5 contains an outline of the summary of other environmental management Issues
- Chapter 6 describes the 6 consistency between IFQ program, West Coast Groundfish FMP and MSA National Standards and Requirements
- Chapter 7 contains the outline of the analysis of cross-cutting mandates.
- Chapters 8 – 11 are reserved for a list of preparers, a glossary and a list of acronyms, an index and the listed references and cited literature.
- Appendix A contains an annotated outline of the RIR/IRFA

- Appendix B is a technical appendix to the Social Impact Assessment. The appendix contains introductory text and an example of the content that would be provided for affected communities.
- Appendix C contains the beginnings of a components analysis.

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Executive Summary

1 Introduction

This introduction discusses the purpose and need for the proposed action. It also provides a historical background and a summary of actions and events that have led to the Council proposals. This introduction also lists the suite of alternatives to be analyzed, including alternatives that were considered but excluded from detailed analysis, and a summary of the scoping process. The introductory chapter ends with a description of how the remainder of the document is organized.

1.1 Purpose and Need for the Proposed Action

The Pacific Fishery Management Council (Council) is considering an individual fishing quota (IFQ) program that would change the primary management tool used to control trawl catch of West Coast groundfish from a system of periodic landing limits to one based on total catch quota shares (QS) where each quota pound (QP) derived from QS could be caught at any time during an open season. The status quo alternative (No Action) is also considered. From the set of alternatives analyzed in this draft EIS, the Council will identify a preferred alternative that will be termed "the proposed action."

In this EIS, QP is the annual catch amount allocated to an individual, whereas QS is the individual's portion as a percentage of the total allocation. IFQs refer to both QS and QP.

1.1.1 Need for Action (Problems for Resolution)

Despite the recently completed buyback program, management of the West Coast limited entry groundfish trawl fishery (West Coast groundfish trawl fishery) is still marked by serious biological, social, and economic concerns, similar to those cited in the US Commission on Ocean Policy's 2004 report. The trawl fishery is currently viewed as economically unsustainable given the current number of participating vessels, the current status of certain groundfish stocks, and the various measures in place to protect those stocks.

One major source of concern stems from the management of bycatch, particularly of overfished species. Over the past several years the Council's groundfish management efforts have been preoccupied with drafting rebuilding plans for overfished species, and general developing management schemes for minimizing bycatch and specific management of overfished species bycatch. Through the groundfish Strategic Plan and the draft Amendment 18 process, the Council has indicated its support for future use of IFQ programs to manage commercial groundfish fisheries. These programs will give individual fishery participants more flexibility in how they participate in the fishery, and more accountability in how individual actions affecting bycatch of overfished species impact the groundfish fishery as a whole.

Upon the recommendations of its Trawl Individual Quota Committee (TIQC), the Council sent the following problem statement out for public review during the public scoping period. The statement summarizes the perceived need for an IFQ-type program on the West Coast:

> As a result of the legal requirement to minimize bycatch of overfished species, considerable harvest opportunity is being forgone in an economically stressed fishery. The West Coast groundfish trawl fishery is a multi-species fishery in which fishermen exert varying and limited control of the mix of species in their catch. The optimum yields (OYs) for many overfished species have been set at low levels, placing a major constraint on the industry's ability to fully

harvest the available OYs of the more abundant target species that co-occur with the overfished species, wasting economic opportunity. Average discard rates for the fleet are applied to projected bycatch of overfished species. These discard rates determine the degree to which managers must constrain the harvest of targeted species that co-occur with overfished species. These discard rates are developed over a long period of time and do not rapidly respond to changes in fishing behavior by individual vessels or for the fleet as a whole. Under this system, there is little direct incentive for individual vessels to do everything possible to avoid take of species for which there are conservation concerns, such as overfished species. In an economically stressed environment, uncertainties about average bycatch rates become highly controversial. As a consequence, members of fishing fleets tend to place pressure on managers to be less conservative in their estimates of bycatch. Given all of these factors, in the current system there are uncertainties about the accuracy of bycatch estimation, few incentives for the individual to reduce personal bycatch rates, and an associated loss of economic opportunity related to the harvest of target species.

The current management regime is not responsive to the wide variety of fishing business strategies and operational concerns. For example, historically the Pacific Council has tried to maintain a year-round groundfish fishery. Such a pattern works well for some business strategies in the industry, but there has been substantial comment from fishermen who would prefer to be able to pursue a more seasonal groundfish fishing strategy. The current management system does not have the flexibility to accommodate these disparate interests. Nor does it have the sophistication, information, and ability to make timely responses necessary to react to changes in market, weather, and harvest conditions that occur during the fishing year. The ability to react to changing conditions is a key factor in conducting an efficient fishery in a manner that is safe for the participants.

Fishery stock depletion and economic deterioration of the fishery are concerns for fishing communities. Communities have a vital interest in the short-term and long-term economic viability of the industry, the income and employment opportunities it provides, and the safety of participants in the fishery.

In summary, management of the fishery is challenged with the competing goals of: minimizing bycatch, taking advantage of the available allowable harvests of more abundant stocks (including conducting safe and efficient harvest activities in a manner that optimizes net benefits over both the short and long term), increasing management efficiency, and responding to community interest.

1.1.2 Purpose of the Proposed Actions

The Council commissioned the TIQC with identifying the elements of a trawl IFQ program and scoping alternatives and potential impacts of those alternatives in support of the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and National Environmental Policy Act (NEPA). At its first meeting in October 2003, the TIQC drafted a set of goals and objectives. The Independent Experts Panel (IEP) and TIQC subsequently recommended modifying some of the goals and objectives. The participation of the TIQC, the IEP, and other entities in the scoping process is described below in Section 1.2.

The following list of "goals, objectives, and constraints and guiding principles" outlines the purpose of the proposed action. This list is based on recommendations of the IEP, as modified by the TIQC and Council. The Council adopted this list in June 2005 while recommending moving forward with an Individual Fishing Quota (IFQ) program for the trawl fishery.

1.1.2.1 Goals

1. Increase regional and national net benefits including improvements in economic, social, environmental and fishery management objectives.
2. Achieve capacity rationalization through market forces and create an environment for decision making that can rapidly and efficiently adjust to changing conditions.

1.1.2.2 Objectives

1. Provide for a viable, profitable and efficient groundfish fishery.
2. Minimize negative ecological impact while taking the available harvest.
3. Reduce bycatch and discard mortality.
4. Promote individual accountability – responsibility for catch (landed catch and discards).
5. Increase stability for business planning.
6. Increase operational flexibility.
7. Minimize adverse effects from an IFQ program on fishing communities to the extent practical.
8. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
9. Provide quality product for the consumer.
10. Increase safety in the fishery.

1.1.2.3 Constraints and Guiding Principles

1. Taking into account the biological structure of the stocks including such factors as populations and genetics.
2. Taking into account the need to ensure that the total OYs and Allowable Biological Catch (ABC) for the trawl and all other sectors are not exceeded.
3. Accounting for total groundfish mortality.
4. Avoiding provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.
5. Avoiding excessive quota concentration.
6. Providing efficient and effective monitoring and enforcement.
7. Designing a responsive review evaluation and modification mechanism.
8. Take into account the management and administrative costs of implementing and overseeing the IFQ program and complementary catch monitoring programs and the limited state and federal resources available.

The relative performance of each of the alternatives with respect to these "goals, objectives, and constraints and guiding principles" is summarized in Section 6.1. Many of these elements are also addressed elsewhere in the analysis, for example in the Chapter 6 discussion of consistency with the Pacific Coast Groundfish Fishery Management Plan (Groundfish FMP) and MSA national standards;

and in Appendices A and B where impacts on net national benefits, small entities and communities are addressed.

1.1.3 Background to Purpose and Need

This section examines the natural, exploitation, and management history of the West Coast groundfish trawl fishery.

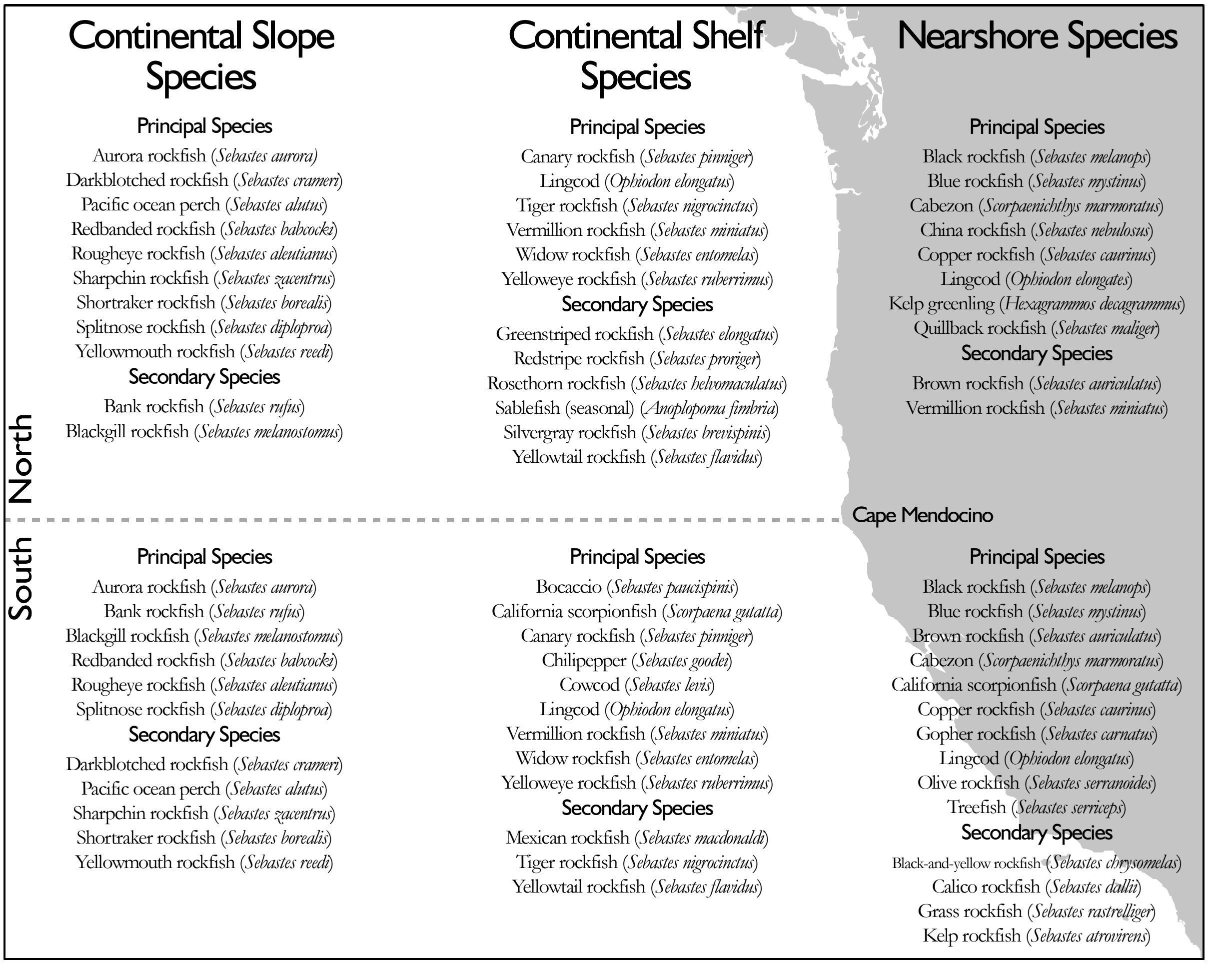
1.1.3.1 Biological Context of West Coast Groundfish

The groundfish covered by the Groundfish FMP include species that live on or near the bottom of the eastern Pacific Ocean within 200 miles of the US West Coast. These include the following species groups:

- **Rockfish.** The FMP covers 64 different species of rockfish, including widow, yellowtail, canary, shortbelly, and vermilion rockfish; bocaccio, chilipepper, cowcod, yelloweye, thornyheads, darkblotched rockfish, and Pacific Ocean perch.
- **Flatfish.** The FMP covers 12 species of flatfish, including various soles, starry flounder, turbot, and sanddab.
- **Roundfish.** The six species of roundfish included in the FMP are lingcod, cabezon, kelp greenling, Pacific cod, Pacific whiting (hake), and sablefish.
- **Sharks and skates.** The six species of sharks and skates in the FMP are leopard shark, soupfin shark, spiny dogfish, big skate, California skate, and longnose skate.
- **Other species.** These include ratfish, finescale codling, and Pacific rattail grenadier.

The list of current trawl target species includes flatfish, roundfish, thornyheads and a few species of rockfish. Primary flatfish target species include petrale sole and Dover sole. Roundfish target species include Pacific whiting, Pacific cod and sablefish. Some rockfish species, especially Pacific Ocean perch and widow rockfish were important trawl targets until the mid 1990s. Rockfish include three genera under the family Scorpaenidae. One genus, *Scorpaena*, forms only a small fishery off southern California. The thornyheads, genus *Sebastolobus*, are occasionally referred to as rockfish, however biologically they are quite different. The genus most commonly referred to as rockfish, *Sebastes*, is a very diverse group. Figure 1-1 shows the distribution of members of the genus *Sebastes* and other groundfish species by latitude and depth association.

Figure 1-1. Latitude and Depth Association of Selected Groundfish Species



West Coast flatfish and roundfish stocks are relatively abundant, short-lived, and productive. Large initial catches of rockfish gave the impression that these stocks were also highly productive. However, increased scientific knowledge of the natural history and stock status of several rockfish species made it clear that most members of the genus *Sebastes* are not able to withstand the level of removals made possible by high intensity fishing pressure using modern fishing methods. There are several reasons for this:

1. Most rockfish are viviparous. Fertilization is internal and the female retains the eggs until they hatch, giving "birth" to live young. This limits the number of eggs that are produced annually.
2. Extreme longevity. Specimens of several rockfish species have been estimated at over 60 years of age, and some over 100 years.
3. Long generation times. Many rockfish species require 10 or more years to reach sexual maturity.
4. Low natural mortality. Rockfish are adapted to relatively slow natural population turnover, unlike species such as Pacific whiting, sablefish and most flatfish.
5. Fecundity increases with age. Evidence shows that older female rockfish actually produce more young than younger ones.

6. Infrequent recruitment success. Ocean conditions or other factors seem to create large variability in recruitment success.
7. Specific habitat requirements vary with life stage. Eggs, larvae, juvenile and adult forms of many rockfish use different types of habitat over their lifecycle.
8. Relatively low mobility of adults. Many rockfish tend to inhabit a particular site for much of their adult life making them particularly susceptible to capture.

The traits of long life, slow growth, viviparity and increasing fecundity with age may have evolved to deal with environmental variability. The ability of Rockfish to live a long time and produce more young with age increases the odds that they will be able to "wait out" poor environmental conditions and produce enough young that a few offspring will likely survive. However, these characteristics also lead to a relatively low productivity for a given biomass and predispose most rockfish to being unable to support large, sustained removals. Low productivity coupled with a tendency to associate with other target species increases management difficulty. This is especially problematic when the associated species differ markedly in life history traits such as generation time, fecundity and natural mortality rate.

1.1.3.2 Groundfish Fisheries Context

The West Coast groundfish trawl fishery consists of a several species of flatfish, roundfish, rockfish, and other species taken using trawl, trap and hook-and-line gears, including recreational gear. The commercial fishery is prosecuted over a wide range of depths, from 20 fathoms for English sole and sanddabs to as deep as 700 fathoms for Dover sole, thornyheads, and sablefish. Fishing may occur on smooth mud/sand substrates, rocky reefs, pinnacles, and canyons. Recreational groundfish fisheries typically occur closer inshore than most commercial fisheries.

West Coast groundfish range from semi-pelagic species like Pacific whiting, shortbelly rockfish, and widow rockfish to demersal species such as Dover sole, lingcod, and thornyheads. Most species primarily inhabit the continental shelf, but Dover sole, thornyheads, rex sole, petrale sole, and some others occur in greatest abundance on the continental slope. The close spatial relationship of certain species often results in large catches of non-target species. This is particularly true in the case of bottom trawl catches. For example, vessels targeting on Dover sole also catch thornyheads, sablefish, and darkblotched rockfish. Several species of rockfish may be caught in a single trawl tow, and the species mix changes from north to south. Historically, widow rockfish, yellowtail rockfish, and canary rockfish were caught in the Vancouver and Columbia management areas, while bocaccio and chilipepper rockfish have been significant catch components in the Monterey and Conception areas. Currently, only a few rockfish species are trawl targets, including yellowtail rockfish in northern midwater fisheries and splitnose rockfish and associated species in the southern slope fishery.

Fishermen can exercise some control over the mix of various species in catches by depth and area shifts in effort as well as modifying the manner in which gear is fished. However, it is often impossible to avoid catch of some non-target species. The fishery's multi-species nature is further complicated by seasonal changes in fish availability, weather, and by market conditions (prices and poundage limits)—factors which may cause a trawler to fish on several species' assemblages in a single fishing trip. Many gear types are used in the commercial groundfish fishery, including trawl nets, traps, and longlines. However, trawl nets (both bottom and midwater types) account for the major portion of the groundfish catch.

In the trawl fishery, some incidental catch of non-targeted groundfish is unavoidable, and for economic or regulatory reasons, some of the catch is discarded. In multi-species fisheries such as this, it is practically impossible to optimize harvests—achieve MSY—for all stocks simultaneously. Optimally harvesting any one stock may result in either under-harvest or over-harvest of co-occurring stocks. While under-harvest is not necessarily a concern from a biological standpoint, it may have economic impacts in terms of forgone revenues and incomes. With the declaration of several species as overfished, over-harvest of co-occurring species has become an acute problem.

Under the Groundfish FMP, when a species is declared overfished, mortality levels for that species must be reduced substantially in order to allow the species to recover to a target biomass capable of supporting MSY. To keep the groundfish fishery within the species-specific catch limits for overfished species (landings plus discard mortality), limits are imposed on the landings of healthy stocks with the goal to reduce the take of the incidentally caught overfished species. The entire fishery may thus be managed based on the constraints imposed by a few species, even if those species are not targeted in any particular fishery, and are only caught incidentally.

The current number of overfished species and their occurrence in different areas and habitats along the West Coast means that virtually all groundfish fisheries are managed in ways that constrain the harvest of the healthy stocks. For this reason, overfished species are sometimes referred to as "constraining stocks," and managing fisheries to prevent overfishing of these stocks is likely to require forgoing substantial potential harvests.

1.1.3.3 Groundfish Management Context

The West Coast groundfish trawl fishery is jointly managed by state and federal authorities under the Magnuson-Stevens Act (MSA), which was passed in 1976 to "Americanize" US fisheries. In addition to establishing eight regional fishery management councils, the MSA extended US fishery management authority in territorial waters from 12 miles out to 200 miles from the shore. On the West Coast, the Council coordinates federal management authority for fisheries occurring in Pacific ocean waters from 3 to 200 miles off California, Oregon and Washington; with the states themselves for fisheries occurring in state waters (i.e., between the shoreline and 3 miles offshore).

Under the MSA, catch by foreign fleets in this "Exclusive Economic Zone" (EEZ) dropped to zero by 1992. However, this decline was more than offset by expansion of the US domestic fleet, which was encouraged by government subsidies. In response to the rapid expansion of the groundfish fishery on the West Coast, the Secretary of Commerce approved the Groundfish FMP in 1982. The Groundfish FMP initially focused on species targeted by the midwater trawl fishery (widow rockfish and Pacific whiting). Over the following decade, several additional species were added to the list of actively managed species, with established optimum yield (OY) catch amounts and, in some cases, sector quotas.

In 1996, the Sustainable Fisheries Act amended and reauthorized the MSA. National standards adopted under the reauthorization include a requirement to prevent overfishing while maintaining, optimum yield (OY). Optimum yield is the harvest amount that will achieve the maximum sustainable yield (MSY), as reduced by relevant economic, social, or ecological factors. Under National Standard 1(d), a stock is considered overfished if current stock biomass is less than 25 percent of the virgin biomass.

The Groundfish FMP currently covers more than 80 species. The Council manages the commercial fishery primarily with bimonthly trip limits set to prevent fishing mortality from exceeding OYs. However, despite increasingly stringent management measures, seven groundfish species are currently overfished as defined under the MSA (bocaccio, canary rockfish, cowcod, darkblotched rockfish, Pacific Ocean perch, widow rockfish and yelloweye rockfish). In January 2000, the Secretary of Commerce declared the West Coast groundfish fishery a federal disaster. In the summer of 2002, the

Council first began implementing depth-based area closures. These measures were designed to exclude fishing effort from those depth zones particularly inhabited by overfished species.

The Council has been developing programs to reduce capacity in the groundfish fisheries since the mid-1980s, culminating with this proposal to move toward an IFQ program. Groundfish FMP Amendments 6, 8, 9 and 14 were drafted specifically to reduce capacity in groundfish fisheries. A vessel buyback program implemented in 2003 reduced the number of groundfish trawl vessels by one-third. Draft FMP Amendment 18 is also expected to lead to capacity reduction by authorizing bycatch accountability conditions. The adoption of a framework and plans for rebuilding overfished species (Amendment 16) has led to the implementation of a vessel monitoring system (VMS) to insure that proscribed fishing does not occur in the RCAs.

1.1.3.4 Limited Entry Fixed Gear Capacity Rationalization

Amendment 8 to the Groundfish FMP was an attempt to implement an IFQ program in the fixed gear sablefish fishery. However this program languished first because of a congressional request for delay and then because of the Magnuson-Stevens Act moratorium on the creation of new IFQ programs. Instead, Amendment 9 was adopted in 1997 establishing limits on this economically valuable fishery. Amendment 9 required that in order to fish in the primary fixed gear sablefish fishery (April 1 to October 31), participating vessels must possess a new sablefish endorsement in addition to a fixed gear limited entry permit. Amendment 14, implemented in 2001, attempted to further rationalize this fishery by establishing a "permit stacking" system. Permit stacking allows a sablefish-endorsed fixed gear permit holder to acquire up to two additional permits and combine them for use on a given vessel. A vessel with stacked permits is assigned to one of three tiers based on the original catch history associated with the permits. Each tier has a different landing limit. A vessel with stacked permits is then eligible to take the landing limit associated with that tier for each permit assigned to the vessel. Thus, a vessel with three permits is eligible to land up to three times as much sablefish as a vessel in the same tier with only one permit.

Since the stacked permits confer fishing eligibility only during the primary sablefish season, the main capacity-reducing effect of Amendment 14 was to remove permits from the other limited entry fixed gear fisheries. Vessels surrendering their permits may still shift to other non-permitted fisheries if a viable opportunity exists. The endorsement and permit stacking regime has also succeeded in eliminating many of the characteristics of a "derby fishery" that plagued this fishery in the past. Derby fisheries result when overcapacity combined with restrictive catch limits serves to concentrate fishing into a very short season. By 1995 the primary sablefish season lasted only one week, which was followed by a brief "mop up" period to reach the established limit or allocation. Permit stacking essentially gives each vessel a fixed quota, which can be caught at any time during the six-month primary season. Although not a freely tradable quota, this system confers a set amount of sablefish harvest opportunity and allows it to be more efficiently allocated among vessels through permit transactions. The permit seller also captures economic rent through the sale. However, since the transferable units are fairly "lumpy", there is no ability to finely divide the amount or timing of quota purchases in this fishery as would be the case under a true transferable quota system.

As of 2002, about one half (83) of the 164 sablefish-endorsed permits were registered to vessels holding more than one permit. Of the vessels with multiple sablefish-endorsed permits, 25 had two permits and 11 had three permits (PFMC 2003b).

1.1.3.4.1 Overfished Species and the Strategic Plan

Under the reauthorized MSA, the National Marine Fisheries Service (NMFS) is required to report to Congress any managed species considered to be overfished or approaching a condition of being overfished. For any fish stock determined to be overfished, the Council is required to prepare a plan to rebuild that stock. The Council developed Amendments 11, 12 and 13 to the FMP to implement this and other new provisions of the 1996 Sustainable Fisheries Act. Following the completion of Amendment 11 in 1998, NMFS declared bocaccio, lingcod, and Pacific Ocean perch to be overfished. Subsequently NMFS declared six additional species to be overfished: canary rockfish and cowcod (in 2000), darkblotched and widow rockfish (in 2001), and yelloweye rockfish and Pacific whiting (in 2002). Pacific whiting was declared rebuilt in 2004, and lingcod was found to be rebuilt following a stock assessment conducted in 2005.

Since the declaration of the first three overfished species in 1999, the Council's groundfish management efforts have largely focused on developing management measures to reduce directed and incidental take of overfished species. To varying degrees, all of the overfished species co-occur with several more healthy and abundant stocks. One of the Council's primary strategies for reducing incidental catch of overfished species has been to limit access to the healthy co-occurring stocks. In response to the consequent severe reductions in available catch, the Secretary of Commerce declared the groundfish fishery to be a commercial fishery failure in January 2000. This declaration freed disaster relief funds for the three West Coast states, and pushed the Council to complete its Strategic Plan on managing the groundfish fisheries in October 2000. One element of the Strategic Plan was an evaluation of overcapacity in the commercial groundfish fleets. This was done by comparing the potential harvest capacity of participating vessels with the amount of fish actually available for harvest. For the non-whiting groundfish trawl fishery, the SSC calculated that 26 to 40 percent of the vessels then participating in the fishery were capable of taking all of the groundfish available for trawl harvest. The Strategic Plan noted that while a reduction of at least 50 percent in the number of trawl vessels was required, rationalization of the West Coast groundfish trawl fishery would not be complete until the capacity level was in balance with the economic value of the resource.

The Strategic Plan recommended a trawl vessel buyback program as a near-term objective, and a trawl IFQ or mandatory permit stacking program[1] as a longer-term objective. An IFQ program for trawlers has been on the Council's official workload list since soon after the adoption of the Strategic Plan. In June 2001, the Council created an Ad Hoc Trawl Permit Stacking Work Group. However, this group met only once on February 26, 2002 before being suspended while the Council addressed other workload priorities and began to develop a vessel buyback program before continuing work on permit stacking.

1.1.3.4.2 Limited Entry Trawl Capacity Rationalization and the Trawl Vessel Buyback

In 1987, the Council appointed an ad hoc Limited Entry Committee to design a groundfish fisheries license limitation program. In 1991, the Council adopted Amendment 6 to the groundfish FMP, a groundfish license limitation program that led to the creation of federal limited entry permits. At that time the Council acknowledged that the license limitation program, while expected to limit the growth of groundfish harvesting capacity, would not resolve the problem of overcapacity in the groundfish fishery. An IFQ program was also considered as a major alternative to the license limitation program. However, at that time there was a great deal of opposition to IFQs across all sectors of industry (vessel owners, operators, crew, processors, and support industries). The license limitation program was seen as a first step toward rationalization of the fleet with further capacity reduction

[1] Mandatory permit stacking reduces capacity in the fishery by requiring permit holders to acquire an additional permit to continue fishing.

measures to follow. NMFS implemented Amendment 6 in 1993, issuing 388 initial limited entry permits with trawl endorsements, in addition to permits issued with endorsements for longline and/or pot (trap) gear. Gear endorsements were used to constrain the number of participants using a particular gear type in the groundfish fishery. As of January 1, 1994, all vessels participating in the limited entry segment of the fishery were required to have permits.

Limited entry permits were issued with capacity endorsements that matched the length of the vessel that originally qualified for the permit. At the recommendation of the Council, NMFS issued a final rule in 1994 allowing permit owners to combine two or more permits to create a permit with a longer length endorsement than any of the original permits. Because a vessel's harvesting capacity increases geometrically (i.e., volumetrically) with an increase in vessel length, NMFS implemented a conversion formula for permit combinations that assigned a certain number of capacity rating points per foot of vessel length. Under this point system, a vessel owner wishing to permit a longer vessel must purchase enough existing permits to create a combined permit with capacity points sufficient for the length of the vessel (See 59 CFR17726, April 14, 1994). By 2003, this permit combination requirement had resulted in the effective removal of 114 trawl permits from the fishery. Of the 388 trawl permits originally issued, there were 274 permits remaining until the 2003 buyback program.

A line item in a 2003 budget bill (PL 108-7) instructed NMFS to implement a fishing capacity reduction program for the non-tribal West Coast groundfish trawl fleet (excluding Pacific whiting catcher-processors). This bill funded the buyback with a $10 million appropriation and a $36 million loan approved by an industry referendum. The loan will be repaid by members of the participating fleets (limited entry groundfish trawl, Dungeness crab pot, and pink shrimp trawl fleets) through landings fees collected over the course of the next 30 years. On August 8, 2005, NMFS published a notice (70FR 45695) announcing that collection for repayment of the loan would commence on September 8, 2005.

Under the buyback program, NMFS retired 91 trawl vessels, their associated state fishing permits, and federal limited entry trawl permits, effective December 4, 2003. The program reduced the available pool of limited entry permits for vessels delivering to shore plants and motherships to 182 permits (including the 10 permits associated with the whiting catcher-processor fleet). Since December 2003, 2 additional permits were retired through permit combination, leaving 180 limited entry trawl permits remaining in the fishery. The 91 vessels retired under the buyback program accounted for 40 percent of the $32 million in ex-vessel revenues delivered by all limited entry groundfish trawlers in 2002 (including deliveries to non-tribal motherships).

Following the completion of the buyback program, NMFS analyzed permit latency in the limited entry trawl fleet to determine whether a significant number of unused or infrequently used permits remained in the fishery. The agency's concern over latent capacity stemmed from public comments observing that permit/vessel owners who had been bought out under the buyback program could rejoin the fishery by simply purchasing a latent permit and vessel. The Council found no need to take remedial action given evidence for relatively low occurrence of highly latent permits and the apparent lack of concern among industry members who bear responsibility for repaying the $36 million loan that funded the buyback.

An IFQ program would obviate the need to address latent permit issues, and is the most efficient way to match capacity with available catch. Consequently, in response to a June 2003 request from members of the groundfish trawl industry, the Council decided to investigate moving forward with a trawl IFQ program as a solution to any remaining permit latency and overcapacity issues in the trawl fishery. The Council authorized appointment of the TIQC, which included representatives from the whiting and non-whiting trawl sectors, shoreside and at-sea processors, environmental organizations and communities. The Council also tasked Council staff with drafting a plan for IFQ program development, identifying budget needs, and pursuing funding options. November 6, 2003 was recommended by TIQC and endorsed by the Council as a control date for IFQ. A *Federal Register Notice* of this control date was published on January 9, 2004 (69FR 1563).

1.1.3.5 Current Groundfish Management System

The groundfish fishery is a multi-species fishery including many species of rockfish, flatfish, sharks and skates, and roundfish. A variety of targeting strategies are pursued using different types of gear, resulting in wide variation in the mix of species caught. Currently the groundfish fishery is divided into sectors: limited entry trawl (further subdivided into the shoreside sector and at-sea whiting sectors); limited entry fixed gear (line gear and pot or trap gear); directed open access using line, pot gear, or other non-groundfish trawl gears; "incidental" open access (vessels targeting non-groundfish species, like crab, salmon, or California halibut, but which occasionally catch groundfish); and a tribal groundfish sector, which includes whiting mothership, trawl and fixed-gear vessels.

Allocating harvest opportunity among different fishery sectors is an integral part of the management process. Some stocks, such as sablefish and Pacific whiting, have fixed or "hard" allocations. Management measures for these species are structured so that particular sectors have the opportunity to catch a fixed percentage of the OY. However, allocations for the majority of groundfish species are determined as part of the process of developing management measures. In these cases, rather than establishing a hard allocation, the Council proposes management measures, evaluates the likely allocations resulting from those measures, and modifies the proposed measures. The proposed modification takes place on the basis of the expected catches, and either establishes an ad hoc allocation (harvest guideline) for the purpose of the period covered by the management measures or a de facto allocation. In this way allocation among sectors is achieved, particularly in deciding harvest allocations between commercial and recreational sectors. The harvest of the four Indian tribes in Washington State is also taken into account when OYs are established. For a few species (sablefish and whiting, for example) a share of the OYs for groundfish species taken in their fisheries is explicitly allocated. For most species, expected tribal harvest levels are taken into account in setting regulations for other sectors but there is not an allocation to the tribes. For the species for which they receive an allocation, the tribes then oversee the prosecution of their fisheries separate from the management of other groundfish fishery sectors.

Since the adoption of FMP Amendment 17 in 2003, groundfish harvest specifications and management measures have been set on a biennial basis. Every even-numbered year the Council adopts OYs and management specifications covering groundfish fisheries for the following two years. The two-year management cycles began with the 2005-2006 fishery. ABCs and OYs are set based on the most recent stock assessments and recommendations from Council advisory bodies and comments from the public. Separate ABCs and OYs are identified for each year in the two-year cycle. Management measures are then crafted to optimize opportunities for commercial and recreational fishers while keeping harvest within the adopted OYs. Recently this process has become a delicate balancing act between the competing demands for groundfish target species from the different sectors, and the additional constraint to minimize mortality of several constraining overfished species, including bycatch (discard) mortality.

Management of commercial fisheries is currently based on four elements: seasons, bimonthly cumulative landings limits, management areas, and exclusion zones or groundfish conservation areas. Landed species can be caught outside of designated exclusion zones that, for commercial fisheries, generally encompass bottom areas on the continental shelf between about 75 fm and 150 fm in depth (varying somewhat with season and year), and are referred to as Rockfish Conservation Areas (RCAs). Landings limits are set based on historical landings of target species from fish tickets, and discard rates for target and incidental catch species obtained from observer sampling of commercial fishing vessels.

1.1.3.5.1 Commercial Fishery Management Measures

1.1.3.5.1.1 Seasons

Most groundfish fisheries are managed to achieve a year-round season. In fact, this is one of the key objectives expressed in the Groundfish FMP because buyers and processors regard a continuous and consistent supply of fish as essential to maintaining markets. Recently, managing fisheries to prevent OYs from being exceeded before the end of the year has become increasingly difficult because of the low harvest limits for some overfished species. Consequently, some fisheries have been closed early. A few groundfish fisheries are managed according to shorter seasons. The Pacific whiting fishery is the most significant example in terms of the volume of landings. Its season usually begins on April 1 and runs until the OY has been caught, usually by late October. The Pacific whiting OY is allocated according to a formula between shore-based, at-sea mothership, at-sea catcher/processor, and tribal fleets. Within a given whiting fleet, participants coordinate fishing behavior to determine how quickly their allocation will be taken or, conversely, how long the season will last. The limited entry fixed gear sablefish fishery is also limited to a “primary season” from April 1 to October 31. While sablefish may be caught by other sectors and fisheries at other times of the year, the allocation and catch limits are smaller.

1.1.3.5.1.2 Cumulative landings limits

Trip limits have been a feature of groundfish management since the inception of the Groundfish FMP. Over time the regime has become more complex, covering a wider range of species and sectors. The basic concept is to set a limit on how much of a given species (or multi-species complex[2]) an individual vessel may land in a fixed time period. Originally, these limits were on a per trip basis. Currently, in order to reduce the likelihood of regulatory discards, the limits are cumulative totals for a two-month period (Jan-Feb, March-Apr, May-June, etc.). Two-month cumulative landings limits are set separately for the limited entry trawl, limited entry fixed gear, and open access sectors. For each of these sectors there are separate limits for US waters north and south of 40°10' N latitude (approximately Cape Mendocino, California). The Pacific whiting fishery is a significant exception to trip limit management. As noted above, it occurs during a season whose length is determined by how quickly the OY is taken.

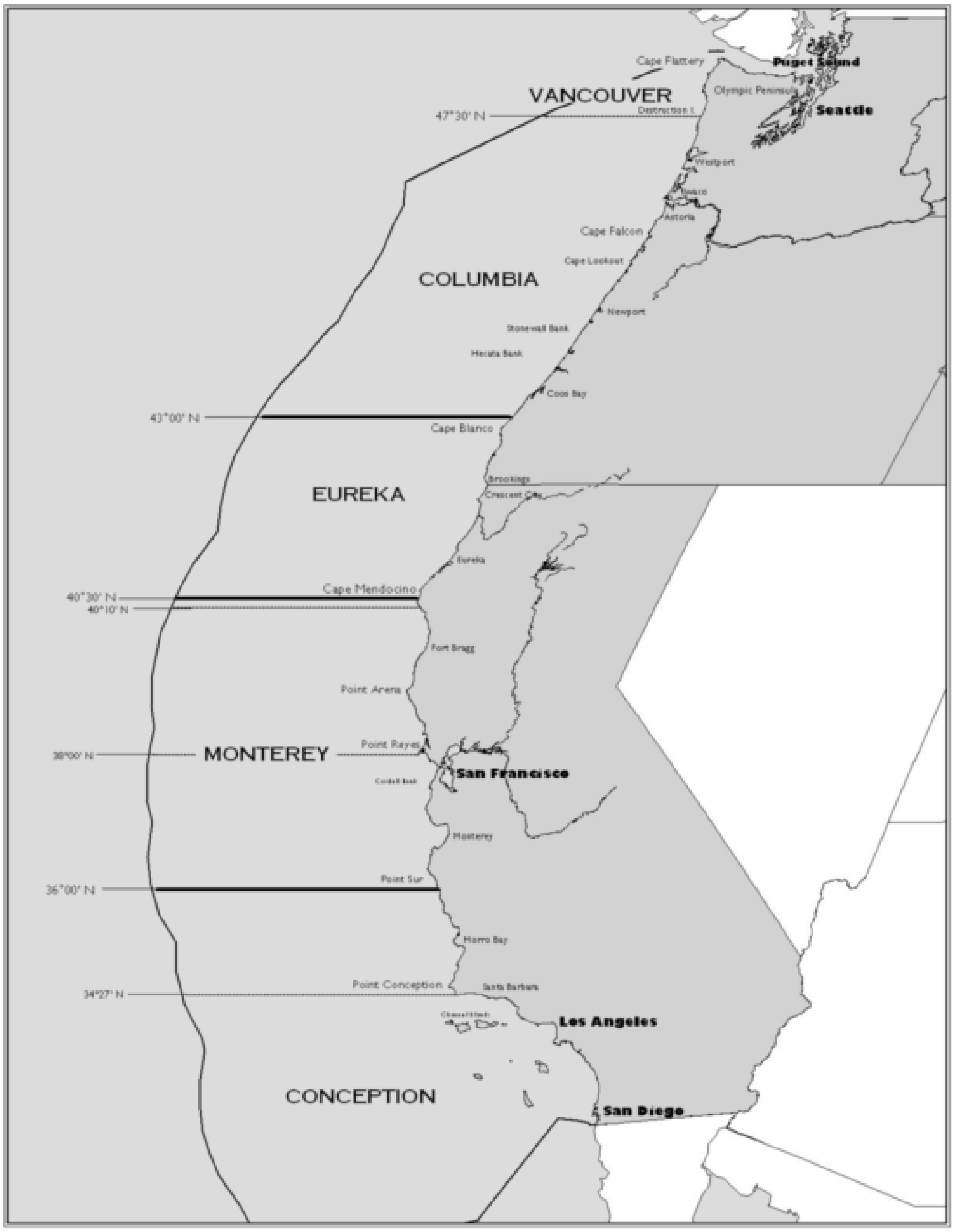
1.1.3.5.1.3 Management Areas

The West Coast EEZ is divided into several, sometimes overlapping, areas, as shown in Figure 1-2. The five named areas (Vancouver, Columbia, Eureka, Monterey, and Conception) were originally devised by the International North Pacific Fishery Commission (INPFC) as statistical areas for cataloguing fish catch. Although still occasionally referred to as “INPFC areas,” this organization is defunct and “management area” is now the preferred term. Landings continue to be reported by these areas in the Groundfish Stock Assessment and Fishery Evaluation (SAFE) document, and these boundaries are sometimes used to demarcate the application of different management measures. The 40°10' N latitude line (near the Eureka-Monterey boundary) is more significant in this respect, as noted above. Landings limits differ north and south of this boundary. Other boundaries in use for

[2] Many commercially less important or less frequently caught species are combined in stock complexes for the purposes of management. These species are not generally differentiated in reported landings, and most have not had stock assessments. Multi-species complexes currently in use include the “minor rockfish” (additionally separated into several sub-categories), “other flatfish”, and “other fish” categories.

management include latitude lines at significant coastal landmarks, such as Point Reyes and Point Conception in California. The latter represents an important marine biogeographic boundary, and is used to bifurcate some stocks (such as sablefish), as well as to differentiate management measures.

Figure 1-2. West Coast Groundfish Management Areas and Other Key Management Lines



1.1.3.5.1.4 Groundfish Conservation Areas

Three different types of closed areas have been implemented to limit bycatch of overfished species. A relatively small Yelloweye Rockfish Conservation Area (YRCA) closes a "hotspot" off the Washington coast. Recreational fishing is prohibited within the YRCA and the area is a designated as a voluntary closure for the limited entry fixed gear sablefish fleet and salmon trollers. The YRCA was first implemented in 2003. There are two areas off the southern California coast designated Cowcod Conservation Areas (CCAs), intended to protect cowcod. Recreational and commercial fishing are prohibited within the CCAs, except that rockfish and lingcod fishing have been permitted shoreward of 20 fathoms. The CCAs were first implemented in 2001. Rockfish Conservation Areas (RCAs) are by far the most extensive and complex closed areas. First implemented in late 2002 as part of an in-season management action, RCAs extend from the Canadian border to the Mexican border of US waters. The RCAs were implemented to reduce bycatch of overfished species. These species are more frequently caught within certain depth ranges. Based on analysis of observer reports and vessel logbooks, the boundaries of the RCAs were set to prohibit bottom fishing within a range of depths where encounters with overfished species were most likely. In order to make enforcement possible, in most cases the actual isobaths—lines of equal depth—are approximated by straight lines between published waypoints. The depths included in RCAs vary by season, latitude, and regulatory sector. Boundaries for limited entry trawl vessels are different than those for the limited entry fixed gear and open access sectors. Figure 1-3 and Figure 1-4 depict the general configuration of the trawl RCA during January and February, and March through October, respectively, of 2005. Note that in Figure 1-4, the width of the RCAs (particularly in the Northern areas) is significantly reduced.

Figure 1-3. Configuration of the trawl RCA and Cowcod Conservation Area during January-February 2005.

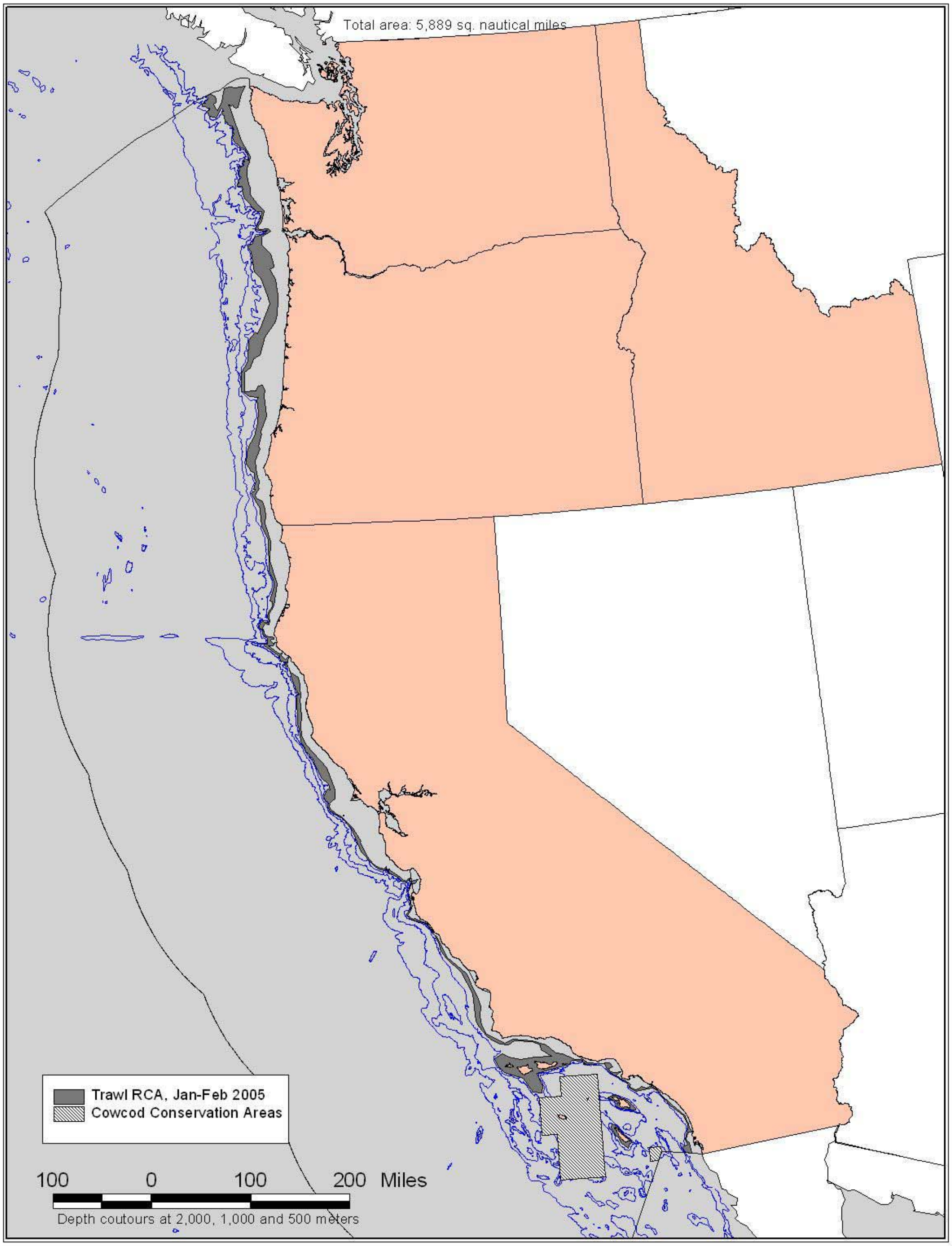
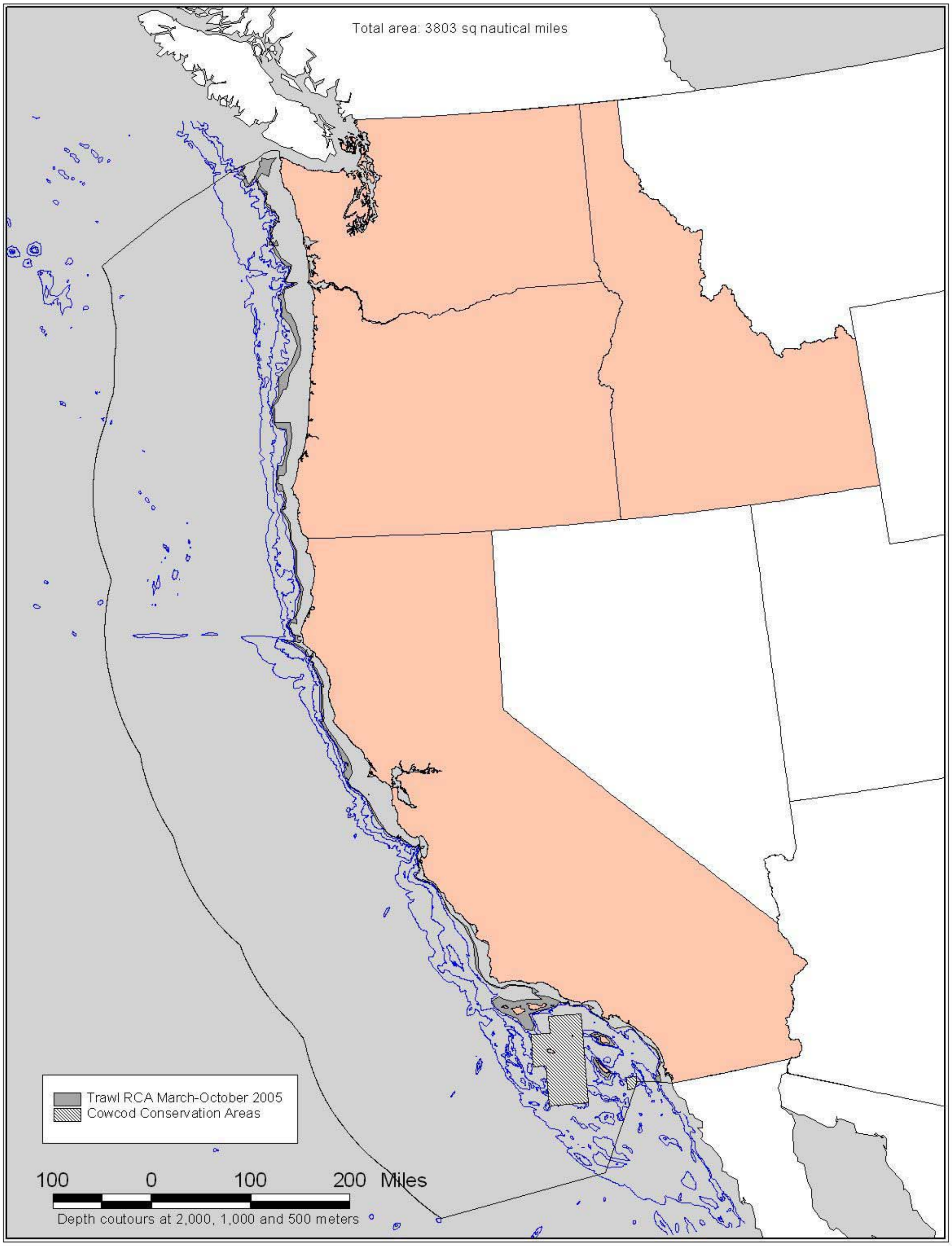


Figure 1-4. Configuration of the trawl RCA and Cowcod Conservation Area during March-October 2005.



1.1.3.5.1.5 Gear Restrictions

Although various gear restrictions were a key feature of groundfish management even before the FMP was implemented, the most important current measures distinguish between large and small footrope gear. This refers to the size of the roller gear affixed to the bottom leading edge of a bottom trawl net. Large footrope gear can allow the net to be fished over rougher ground. Large footrope gear is also preferred when trawling for Dover sole, thornyheads, and sablefish (DTS species) on the soft bottom areas offshore, while small footropes are more commonly used to fish in areas shoreward of the RCAs. Since rocky habitat areas nearshore and on the continental shelf are important to a range of organisms, including several overfished rockfish species, the Council developed measures to discourage fishing on these sites. Beginning in 2003, vessels using small footrope trawl gear (and therefore more likely to be fishing shoreward of the RCA) at any time during a cumulative limit period are subject to lower DTS species landings limits. So if small footrope gear is used at all during that period, the amount of fish that can be landed during the period is significantly reduced. This restriction is meant to encourage vessels to fish exclusively seaward of the RCA (and using large footrope gear), thereby avoiding bycatch of overfished groundfish species (particularly canary rockfish) that are found on the continental shelf. An exception is selective flatfish trawl (SFT) gear, which can be used shoreward of the RCA in association with relatively higher cumulative trip limits to target flatfish. In order to qualify as SFT gear, the net must have a headrope at least 30 percent longer than the footrope, the rise of the net cannot exceed 3 ft, the headrope must not have any floats along the center 50 percent of its length, it must be a two-seam trawl net, and otherwise qualify as legal small-footrope trawl gear as defined in federal regulations. Also, in some non-groundfish (incidental open access) fisheries, such the pink shrimp fishery, bycatch reduction devices (BRDs) are required. These devices are added to the trawl net and divert finfish (such as canary rockfish) out of the codend of the net, where the shrimp catch is accumulated.

1.1.3.5.1.6 Observer Coverage

With the exception of the Pacific whiting fleets, there has been no consistent and comprehensive monitoring of groundfish total catch or discards on the West Coast. Vessels participating in the at-sea Pacific whiting fisheries have been voluntarily carrying observers since 1991. NMFS made observer coverage mandatory for at-sea processors in July 2004 (65 FR 31751). The Shoreside Whiting Observation Program (SWOP) was established in 1992 to examine bycatch in the directed Pacific whiting fishery. Participating vessels must carry an exempted fishing permit (EFP) issued by NMFS, and are required to retain all catch and to land unsorted catch at designated shoreside processing plants. In return, permitted vessels are not penalized for landing prohibited species (e.g., Pacific salmon, Pacific halibut, Dungeness crab), nor are they held liable for exceeding groundfish trip limits. Beginning in 2001, the West Coast Groundfish Observer Program (WCGOP) has placed observers on selected non-whiting groundfish vessels. NMFS first implemented the WCGOP in August 2001 to directly observe groundfish discards in the commercial fishery. Observers initially covered about 10 percent of the West Coast limited entry trawl fleet effort, selected via a stratified random sample. Coverage has since increased to about 20 percent and has also been expanded to include the limited entry fixed-gear and open access vessels. This WCGOP generates the incidental catch and discard rates currently used to set cumulative trip limits in the non-whiting fisheries.

1.1.3.5.2 Recreational Fishery Management Measures

Recreational fisheries typically occur closer inshore than most commercial fisheries and are actively managed by the states. Thus, recreational management measures, although developed through the Council process, tend to differ between states. The main recreational management measures used are season limitations, bag limits, which restrict the number of groundfish an angler may land, and size (length) restrictions. Since some overfished species are frequently caught in recreational fisheries, species-specific sub-limits are applied within the overall groundfish bag limit. Closed seasons have also been imposed in response to overfishing. The most recent response to recreational take of overfished species has been to establish depth-based area restrictions. Although similar in concept and intent to the RCAs, recreational area restrictions generally limit recreational groundfish fishing to depths less than a specified value (e.g., 30 fm). Boundaries defined by waypoints for these areas generally have not been used.

1.2 Scoping Summary

1.2.1 Background to Scoping

Although a formally announced public scoping on a potential trawl IFQ program EIS under NEPA did not begin until May 24, 2004, the Council began preliminary scoping of alternatives for reducing harvest capacity and bycatch in the trawl fisheries in September 2003.[3] Following the September 2003 meeting, the Council Chair appointed the TIQC from a broad range of constituencies. The TIQC has served as the Council's initial scoping vehicle, conducting public meetings to examine what elements a trawl individual quota program should contain if such a program were implemented. In this role, the TIQC met to discuss and develop proposed alternatives five times: October 28-29, 2003; March 17-18, 2004; October 26-27, 2004; February 23-24, 2005; and May 10-11, 2005.

1.2.2 Council and Agency NEPA Scoping

A number of other Council committees were formed or enlisted to support the TIQC process, including the Council's Enforcement Group, the TIQ Analytical Team, and TIQ Independent Experts Panel. The Enforcement Group developed enforcement program alternatives during meetings on May 25-26, 2004, and September 28, 2004. Analytical Team members from NMFS and California Department of Fish and Game, supported by Council staff and private contractors, worked to supply the analytical demands of the TIQC process throughout the scoping period. The Analytical Team met four times: June 8-9, 2004; July 1-2, 2004; September 7-8, 2004; and November 16-17, 2004.

Trawl IFQ program issues were also discussed by the Council's Allocation Committee at several of its public meetings between September 2003 and November 2005. The Allocation Committee is particularly interested in this issue because implementing an IFQ program for the trawl fleet would, at a minimum, require the Council to allocate catch of groundfish species and species complexes between limited entry trawl and the other fleets. The Allocation Committee is also currently engaged in developing sector allocations for groundfish species in response to the framework adopted under the draft FMP Amendment 18 process.

NMFS published a notice of intent to develop a trawl IFQ program EIS and formally initiate scoping on May 24, 2004 (69 FR 29482). The Council's formally announced NEPA public scoping period ran from May 24, 2004 through August 2, 2004. Three NEPA scoping hearings were held: June 13, 2004 in Foster City, California; July 20, 2004 in Seattle, Washington; and July 27, 2004 in Newport, Oregon.

[3] Note that IFQs were an alternative under the 1991 Amendment 6 groundfish license limitation program, and have been raised in Council discussions about management alternatives before and since that time.

Having received the results from public scoping and input from Council advisory bodies, the Council voted in June 2005 to forward for analysis in a draft EIS, the following draft TIQ alternatives covering trawl harvest and processing of West Coast groundfish, including Pacific whiting:

- Alternative 1: Status quo
- Alternative 2: IFQs for trawl target species and species for which allocations exist
- Alternative 3: IFQs for all groundfish except the "other fish" category of groundfish **with** adjustments at low harvest levels
- Alternative 4: IFQs for all groundfish except the "other fish" category of groundfish **without** adjustments at low harvest levels
- Alternative 5: IFQs for all groundfish
- *Alternative 6: IFQs for overfished species only (this alternative was later dropped)*
- Alternative 7: Permit stacking (one cumulative limit for each permit associated with a vessel)

In November 2005, the Council recommended some changes to the EIS analysis commissioned in June, including: (1) eliminating a provision requiring processor participation[4] in collaboratives of quota share holders competing for quota set aside to benefit communities; (2) creating a community advisory panel as part of the Council process; and (3) dropping Alternative 6, which would have created a trawl individual quota program only for overfished species.

The timeline for progressing on the draft EIS will depend on available funding. In September 2005, the Council selected a contractor to work on Stage 1 of the EIS process, drafting an annotated outline of the EIS and associated documents to be used in phase two of the process, drafting the EIS itself.

1.2.3 Summary of Comments Received

Comments received during the May 24, 2004 through August 2, 2004 NEPA public scoping period are summarized in a separate document, *Staff Summary of Public Comment on Trawl Individual Quotas*, PFMC, September 2004.

1.3 Organization of This Document

This document currently consists of 11 chapters and 3 appendices. Following this introductory chapter, the remaining chapters of this document cover the following material:

- Chapter 2: Provides a description of the proposed alternatives, including a detailed component-by-component breakout, and a discussion of alternatives considered but excluded from detailed analysis.

[4] The Council's November 2005 recommendation eliminated the provision requiring community benefit set-aside QP applicants to submit harvester/processor joint venture proposals, instead opening the community set-aside QP proposal process to any IFQ holder (who may or may not chose to collaborate with another entity). Under those alternatives and options providing for direct allocations of IFQ to processors (or that would otherwise allow processors to become direct IFQ holders), processors holding IFQ could apply for community set-aside QP without taking on a harvester sector partner just as harvesters holding IFQ could apply for community set-aside QP without taking on a processing sector partner.

- Chapter 3: Provides summary profiles of potentially affected resources and stakeholder groups, including descriptions of historical and baseline conditions, mechanisms for change, and indicators used to measure change.
- Chapter 4: Evaluates the direct, indirect and cumulative effects of the alternatives on the resources and stakeholder groups of concern. The analysis uses a “resource-based” approach whereby a single section of the document examines and describes the direct, indirect and cumulative effects of each alternative on a particular resource or stakeholder group.
- Chapter 5: Contains a review of other issues typically found in NEPA documents including short-term uses versus long-term productivity, irreversible resource commitments, and energy requirements and conservation potential of the alternatives.
- Chapter 6: Examines the consistency of the proposed action with the TIQ program goals, objectives, and constraints and guiding principles (listed in Section 1.1.2); the Groundfish FMP goals and objectives; and the national standards and other provisions of the MSA.
- Chapter 7: Examines consistency with other federal laws and Executive Orders.
- Chapter 8: Lists the individual preparers of this document.
- Chapter 9: Presents a glossary of technical terms and a list of acronyms used in this document.
- Chapter 10: Provides a list of the literature cited in this document.
- Chapter 11: Provides a general keyword index to the document.
- Appendix A: Contains the Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis (IRFA).
- Appendix B: Contains the Social Impact Assessment Technical Appendix.
- Appendix C: Contains a detailed analysis of the components, elements and options underlying the Action Alternatives.

2 Description of Proposed Alternatives

2.1 Alternatives Forwarded for Analysis

The Council, with considerable input from the TIQC and TIQ Analytical Team, forwarded an initial suite of six alternatives for analysis. After discussions between the Consulting Team and the Council Staff, it was determined that the differences between two of the alternatives were relatively minor and did not require a full analysis—differences could be discussed as sub-option to a single alternative.[5] As a result of these discussions it was determined that the list of alternatives forwarded for detailed analysis could be reduced from six to five.

The alternatives analyzed include a "no-action" alternative, three alternatives involving IFQs, and an alternative allowing the stacking of permits. These five alternatives are summarized below in terms of the basic management regimes that would be employed:

Alternative 1: The No-Action Alternative. The status quo management regime for groundfish species would be continued. Only limited entry trawl permit holders would fish for groundfish with trawl gear. Whiting would be managed with special seasons and allocations to sectors defined by the processor of the whiting; Non-whiting groundfish with the exception of Other Species would be managed with cumulative landings limits issued to all limited entry trawl permit holders every two months. Catches of Other Species of groundfish—sharks (except spiny dogfish), skates, rays, ratfish, morids, grenadiers, etc. (Note: spiny dogfish, cabezon, and kelp greenling would likely be managed separate from Other Species)—would be monitored but Optimum Yields (OYs) would not be constraining. Reporting of at-sea discards of groundfish would not be required. If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors.

Alternative 2: IFQs for whiting and Trawl Target Species. Whiting seasons and sectors would be maintained, and an additional non-whiting sector would be established. IFQs are not issued for incidentally caught groundfish—these are managed with transferable, bi-monthly cumulative catch limits. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. Catches of Other Species of groundfish would be monitored. For IFQ species, management does not change with low OYs. If the OY for a non-IFQ species becomes extremely low (such as for a rebuilding species). The species would be managed with nontransferable cumulative catch limits.

Alternative 3: IFQs for all groundfish species except Other Species. Whiting seasons would be eliminated, but whiting sectors are maintained. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. Catches of Other Species would be monitored. If the OY for any species becomes extremely low, management would switch from IFQs for that species, and instead the species would be managed under sector allocations as a pool using nontransferable cumulative catch limits to control catch.

[5] The two similar alternatives—Original Alternative 3 and Original Alternative 4—both allocated QS/QP for all but "other species", but differed in way they treated species with Low OYs, and in the basic allocation of QS/QP. However, Original Alternative 5, which allocates QS/QP for all species, used the same Low OY treatment and the same basic QS/QP allocation as Original Alternative 4. Therefore it was determined that dropping Original Alternative 4 would not leave any significant programmatic options unanalyzed. The Alternatives as originally forwarded to Consulting Team can be viewed at http://www.pcouncil.org/groundfish/gfifq.html

Alternative 4: IFQs for all groundfish species. The distinction between whiting sectors would be eliminated. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. OYs for each of the Other Species of groundfish would be would be established. If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species.

Alternative 5: **Permit stacking.** Groundfish would be managed as under the No-Action Alternative, but limited entry trawl permit holders would be allowed to "stack" additional permits. Permit holders would be issued a full complement cumulative trip limit pounds for each permit they own. Whiting seasons and sectors would be maintained. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. Catches of Other Species would be monitored. If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species.

In addition to the various management regimes described above, the three IFQ alternatives (Alternatives 2 – 4) differ with respect to the way in which quota shares are allocated. The Council developed three basic allocations and incorporated them into three IFQ programs (currently labeled Program A, Program B, and Program C). The allocations differ primarily in terms of which groups would receive quota and how much each group would receive. These are summarized below:

Program A: Harvesters and processors are initially allocated equal amounts of QS that give them rights to harvest groundfish. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. Program A would be applied to Alternative 3.

Program B: Harvesters and processors are allocated QS that give them rights to harvest groundfish. Split options include: a) 100/0 for all groundfish, b) 100/0 for non-whiting and 50/50 for whiting, and c) 90/10 for all groundfish. Processors are defined as in the FMP—those facilities that process either unprocessed or already processed groundfish or receive live fish for resale. Program B would be applied to Alternative 3.

Program C: Harvesters and processors are allocated QS that give them rights to harvest groundfish. Harvesters would initially receive 75 percent of the QS and processors would receive the remaining 25 percent. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. Program C would be applied to Alternative 2, 3, and 4.

All three of the programs are applied to Alternative 3 as options. In effect, this generates three new alternatives: Alternatives 3A, 3B, and 3C. In addition it should be noted that Program B contains three different allocation schemes, and that these schemes also have the potential to significantly alter the impacts of the alternative. The end result is that Alternative 3 might reasonably be analyzed as five different alternatives: Alternatives 3A, 3Ba, 3Bb, 3Bc, and 3C.

Table 2-1 and Table 2-2, below, present details of the various elements and options that make up each of the alternatives. The tables are similar to those produced for the Council, and contain references to the IFQ Scoping Results Document[6] and various options described within that document.

[6] National Environmental Policy Act Scoping Results Document: Individual Fishing Quotas (A Kind of Dedicated Access Privilege) and Other Catch Control Tools for the Pacific Coast Limited Entry Trawl Groundfish Fishery. Pacific Fishery Management Council, July 2005.

Table 2-1. Management Regime Alternatives for Analysis

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
COMPONENT 1: CATCH CONTROL TOOLS					
IFQ Program for <u>Non-Whiting</u> and <u>Whiting</u> Trips					
Element 1.1 IFQ Program to Be Applied **(See Table 2-2)**	No IFQ Program.	Program C	Alternative 3A - Program A Alternative 3B - Program B Alternative 3C - Program C	Program C	No IFQ Program.
Additional Control Tools (Sections 2.1.1.2 of the Scoping Results Document).[a]/					
Element 1.2 **Permit Stacking**	-- -- -- None -- -- --				One set of trip limits issued for each of a maximum of 3 permits attached to vessel. Only one of the permits attached to the vessel would need to be of the appropriate length.
Element 1.3 **Cumulative Trip Limits**	Cumulative landing limits. (One set of limits for each vessel to which a permit is assigned.)	Transferable cumulative catch limits.[b]/ Cumulative limits would be transferable on a temporary basis between vessels within the period (full or partial limit transfers would be allowed, depending on length of limit period)	Cumulative catch limits (One set of limits for each vessel to which a permit is assigned.)	None	Cumulative catch limits. (One set of limits for each permit.)

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 1.4 Adjustments for Low OYs					
Allocation	- -- -- -- -- -- -- -- -- The Council may suspend intersector allocations when a species is overfished -- -- -- -- -- -- -- --				
Catch Control Rules	N/A	Adjust rules for low OY conditions (as specified in Component 2). *IFQ species – No change.* *Non-IFQ species – For species meeting the low OY threshold switch from transferable to **non**transferable cumulative catch limits.*[c/]	**Option 1**: Adjust rules for low OY conditions (as specified in Component 2). *For low OY species, except whiting, switch from IFQs for that species and instead manage the sector allocation as a pool using nontransferable cumulative catch limits to control catch.*[d/] **Option 2:** No low OY adjustments.	N/A	N/A
Threshold	N/A	Low OY Threshold: Establish a threshold at which point a species would switch to "Low OY management." (e.g., $B_{25\%}$)	Low OY Threshold: Decide on application of "Low OY management" as part of the biennial specifications process.	N/A	N/A
Element 1.5 General Season Closures	-- -- -- -- When all sectors in aggregate reach the overall OY for a species, seasons close for the affected species -- -- -- --				
Element 1.6 Whiting Season Openings	Staggered season openings for each whiting sector.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Same as no action.
Element 1.7 Whiting Season Closings	Whiting season closes for a sector on attainment of whiting allocation. Whiting season closure on attainment of bycatch caps for species with bycatch caps.	Whiting season closure on attainment of bycatch caps for species with bycatch caps.[i/]	Open until end of year.	Open until end of year.	Same as no action

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
COMPONENT 2					
Sector/Species Group Combinations and the Catch Control Tools To Be Applied (Section 2.1.1.3 & 2.1.1.4 of the scoping results document)					
Element 2.1 Sectors Define Whiting Trip: Opt 1-- >50% non-whiting Opt 2-- >50% or >10,000 lbs non-whiting	Three sectors: ▪ shoreside (SS) deliveries ▪ mothership (MS) deliveries ▪ catcher-processor (CP) deliveries	Four sectors: ▪ SS non-whiting deliveries ▪ SS non-non-whiting deliveries ▪ MS deliveries ▪ CP deliveries (FROM Scoping Results Doc: 2.1.1.4 Option 3)	Three sectors: ▪ SS deliveries ▪ MS deliveries ▪ CP deliveries (FROM Scoping Results Doc: 2.1.1.4 Option 2)	One sector (FROM Scoping Results Doc: 2.1.1.4 Option 1)	Three sectors: ▪ SS deliveries ▪ MS deliveries ▪ CP deliveries
Element 2.2 Primary Trawl Target and Allocated Species[e/] **(Except Whiting)**	All sectors: cumulative landing limits. Trawl fishery closes on attainment of cap, guideline or OY. Non-whiting season closes on attainment of non-whiting fishery bycatch cap for non-whiting species.	SS non-whiting sector IFQs SS, MS, & CP non-whiting sectors: catch caps for these species. A sector's non-whiting season closes on attainment of that sector's non-whiting fishery catch cap for non-whiting species. No cumulative catch limits. Midseason rollovers for excess cap amounts and augmentation of caps thru acquisition of SS IFQ.	Sector specific IFQs (Low OY Conditions: Option 1: switch to nontransferable cumulative catch limits and close on attainment of sector limits; Option 2: continue use of IFQs.)	IFQ	Cumulative catch limits with permit stacking rules applied for non-whiting trips. Non-whiting season closes on attainment of non-whiting fishery bycatch cap for non-whiting species. Stacked permits may not be used to cover catch on whiting trips.
Element 2.3 Whiting	All sectors: non-whiting season (no vessel landing limits). Outside the non-whiting season shoreside deliveries allowed under cumulative non-whiting landing limits. Midseason rollover of excess allocation to another sector.	Catch covered by SS non-whiting IFQ is also constrained year-round by nontransferable cumulative non-whiting cumulative catch limits. SS, MS, & CP non-whiting sectors: IFQs during non-whiting season. Midseason non-whiting rollover to another sector Opt 1: Not allowed; Opt 2: Allowed following specified procedures.	Sector specific IFQs during the non-whiting season. If SS non-whiting is closed SS whiting IFQs may continue to be used, subject to nontransferable cumulative non-whiting catch limits.	IFQs during the non-whiting season. IFQs and nontransferable cumulative non-whiting catch limits for shoreside deliveries outside the non-whiting season.	All sectors: non-whiting season (no vessel landing limits). Outside the non-whiting season shoreside deliveries allowed under cumulative non-whiting catch limits. Permit stacking rules do not apply for cumulative non-whiting limits. Midseason rollover of excess allocation to another sector.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 2.4 Unallocated Shared Target and Incidental Species Currently Managed With Cumulative Limits	All sectors: cumulative landing limits Trawl fishery closes on attainment of cap, guideline or OY. Non-whiting season closes on attainment of non-whiting fishery bycatch cap for non-whiting species.	SS non-non-whiting trips Transferable cumulative catch limits. Option for >2 mo cumulative periods and midperiod transfers. (Low OY conditions: switch to nontransferable cumulative catch limits) SS, MS, & CP non-whiting sectors: For species without caps: non-whiting species catch is limited by to a single cumulative catch limits regardless of the number of transferable limits held by a vessel. For non-whiting species with caps, same as Element 2.3.	Sector specific IFQs. (Low OY Conditions: Same as for "Primary Trawl Target and Allocated Species" (Element 2.2))	IFQ	Cumulative catch limits with permit stacking rules applied for non-whiting trips. Non-whiting season closes on attainment of non-whiting fishery bycatch cap for non-whiting species. Stacked permits may not be used to cover catch on whiting trips.
Element 2.5 "Other Fish" Groundfish[f/g/]	Status Quo. Currently: monitoring only. May change to cumulative limits.	Same as status quo.[h/]	Same as status quo.[h/]	IFQ	Same as status quo.[h/]

Component 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl

(Section 2.1.1.5 of the Scoping Results Document)

Element 3.1 **Trawl Vessel Exempted Gear Quota Accounting and Catch Control (Includes Exempted Trawl and Exempted Non-trawl Gears)**	**Exempted gea**r catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[i/] but is subject to open access (OA) trip limits.	**Exempted gear** - IFQ is **not** required. Catch counts against the OA allocation and is managed as part of the OA fishery. Some catch will be allocated from the LE trawl to OA fishery. (FROM Scoping Results Document Section 2.1.1.5 Opt 2C)	**Exempted gear -** IFQ required. Catch counts against LE Trawl. Open access catch control regulations apply. (FROM 2.1.1.5 Scoping Results Document Section Option 1A)	**Exempted gear -** IFQ required. Catch counts against LE Trawl. Open access trip limits **do not** apply. (FRM 2.1.1.5 Scoping Results Doc Option 1B)	**Exempted gea**r catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[h/] but is subject to open access (OA) trip limits OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 3.2 **Trawl Vessel Longline and Fish Pot Without and With LE Endorsement (Fixed Gear Quota Accounting and Catch Control)**	**Unendorsed longline & fishpot** catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[i/] but is subject to open access trip limits. **LE endorsed fixed Gear** - Rules for the LE fixed gear fishery apply when the vessel is using fixed gear. Vessels fish against the limited entry allocation[i/] and are constrained by fixed gear trip limits while using fixed gear.	**Unendorsed longline & fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed gear catch control regulations apply. **LE endorsed fixed gear –** While using fixed gear, IFQ is not required, catch is constrained by LE fixed gear limits and counts toward the LE fixed gear allocation. (FROM 2.1.1.5 Scoping Results Doc, Option 1A)	**Unendorsed longline and fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed catch control regulations **do not** apply. **LE endorsed fixed gear –** While using fixed gear, IFQ is not required for catch taken toward LE fixed gear cumulative or daily limits and such catch counts toward the LE fixed gear allocation. Catch in excess of LE fixed gear trip limits may be taken if covered by IFQ. (FROM 2.1.1.5 Scoping Results Doc, Opt 1B)	**Unendorsed longline & fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed catch control regulations **do not** apply. **LE endorsed fixed gear** - While using fixed gear, IFQ is not required for catch taken toward LE fixed gear cumulative or daily limits and such catch counts toward the LE fixed gear allocation. Catch in excess of LE fixed gear trip limits may be taken if covered by IFQ. (FRM 2.1.1.5 Scoping Results Doc, Opt 1B)	**Unendorsed longline & fishpot** catch by LE trawl vessels counts against LE allocation[i/] (trawl and fixed gear)[i/] but is subject to open access trip limits. OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions. **LE endorsed fixed gear** - Rules for the LE fixed gear fishery apply when the vessel is using fixed gear. Vessels fish against the LE allocation[i/] and constrained by fixed gear limits while using fixed gear. Or permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions (except when fishing tier limits).
Component 4. Monitoring and Enforcement					
At-sea Observers/ Monitoring	Biological observers on some SS catcher vessel trips, 100% observers for at-sea deliveries (MS and CP)	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4).	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4)	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4)	100% at-sea monitoring.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Component 5. Area Management (Decision Table B from Scoping Results Document)					
	Species divided by areas based on stock assessment information. New area divisions created as stock assessment information indicates need.	Program Option for All Action Alternatives: Plan to establish additional regional management areas as needed at a later time. Process Option: Task a group to begin considering the need for additional regional management areas (biological or socio-economic) and potential boundaries along with a process for identifying and responding to regional management area issues that may develop or become more apparent in the future. **Decision deferred until additional information is available, e.g. preliminary DEIS is ready.**			
Component 6. Sector Allocation					
Element 6.1 Within Trawl (Decision Table E from Scoping Results Document)	Whiting allocation rules. No other within trawl allocations.	Establish within trawl allocations based on each sectors relative shares during the time period used for initial allocation. If time periods are different for different sectors use only those years in common to all sectors or calculate a percentage based on each sectors period then adjust all sectors proportionally so that the result sums to 100%. Consider applying the IFQ allocation recency requirement (if any) to eliminate from the sector calculation the catch history of any vessel that has not been active in recent years.			Whiting allocation rules. No other within trawl allocations.
Element 6.2 Trawl/All-Other-Gear		Establish needed intersector allocations through the intersector allocation process.			
Element 6.3 Trawl/ Open Access	N/A	Augment the open access allocation to account for trawl vessels fishing with open access gear on the open access allocation (Element 3.1)	N/A	N/A	N/A

Table 2-2. IFQ Program Design Alternatives for Analysis

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.0 IFQ Allocation			
B.1.1 Eligible Groups	Allocate 50% of quota shares to current permit owners and 50% to processors (Option 3b).[7]	Eligible Group Suboption B-1. Allocate 100% of quota shares to current permit owners (Option 1 from Appendix B). Eligible Group Suboption B-2. Allocate 100% of quota shares for non-whiting species to current permit owners and 50% of the quota shares for whiting species to current permit owners. Allocate 50% of the quota shares for whiting species to processors. (New Option, June 2005) Eligible Group Suboption B-3. 90% of quota shares to current permit owners and 10% to processors. (New Option, June 2005).	Allocate 75% of quota shares to current permit owners and 25% to processors (Option 3a).
Processor Definition:	Use special IFQ Program definition (processors: receive and process unprocessed fish; or catch and process) (Option 1).	Use FMP Definition (processors process unprocessed and already processed fish or receive live fish for resale) (Option 2).	Same as Program A.

[7] References to Options refer to options at they were described in the Scoping Results Document, i.e. *National Environmental Policy Act Scoping Results Document: Individual Fishing Quotas (A Kind of Dedicated Access Privilege) and Other Catch Control Tools for the Pacific Coast Limited Entry Trawl Groundfish Fishery*. Pacific Fishery Management Council, July 2005.

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.2 Qualifying Criteria: Recent Participation	**Harvesters (including catcher-processors):** 1998-2003 participation required in order to qualify for an initial allocation of quota shares (number of trips or years to be specified). (Option 2). **For shoreside processors and motherships:** 1999-2004 recent participation requirement (the number of trips or years is yet to be specified). (Option 4).	All Members of Eligible Groups: No recent participation required in order to qualify for an initial allocation of quota shares (Option 1). **OR** All Members of Eligible Groups: 1998-2003 participation required (one trawl groundfish landing/delivery of any groundfish species) in order to qualify for an initial allocation of quota shares. (Option 2).	Same as Program A.
B.1.3 Elements of the Allocation "Formula"			
Vessel/Permit Related Allocation	Catcher vessel permit owners will receive quota shares based on their permit history plus an equal division of the quota that could be attributed to permit history of bought-back permits (catcher-processors permit owners will not receive a portion of the quota shares distributed on an equal sharing basis) (Option 2). Suboptions for incidentally caught overfished species, either: (a) same as for Other Fish OR (b) equally divide quota for incidentally caught overfished species. For catcher-processors permit owners, use an allocation schedule developed by unanimous consent of that sector (to be provided).	Same as Program A, except no special catcher-processor schedule.	Same as Program A.
Processor Allocation	Processors are allocated quota shares based entirely on the processing of groundfish trawl landings received unprocessed (Option 1).		
B.1.4 History: Species/Species Groups to Be Used for Allocation	Allocate Quota Shares Based on Individual Species/Species Groups: Allocate quota shares for each species/species group based on relative amounts of each respective species/species group caught/landed or processed - for permits applies to permit history; for processors applies to amounts processed (Option 2).		

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.5 History: Allocation Periods			
Periods/Years to Drop:	Options are identical under all programs. Vessels: 1994-2003. Drop 2 years for whiting sector fishing (applies to incidental harvest and whiting). Drop 3 years for non-whiting sector fishing. (Option 1, Sub-option B) Shore Processors: 1999-2004. Drop 2 years. (Option 5, Sub-option B) Motherships: 1998-2003. No opportunity to drop worst year. (Option 4, Sub-option A)		
Weighting Among Years:	Absolute pounds - no weighting between years (Sub-option (i)).	Relative pounds (calculate history based on the entity's percent share of each year's total) (Sub-option (ii)).	Same as Program B
B.1.6 History: Combined Permits and Other Exceptional Situations			
Combined permits:	All permits count. History of the permits combined into a single permit goes to the resulting permit (Option 1).		
Illegal landings/catch:	Don't count Illegal landings/catch under any program.		
Landings in excess of trip limits, as authorized under an EFP:	Don't count landings in excess of the cumulative limit in place for the non-EFP fishery under any program		
Compensation fish:	Don't count compensation fish under any program.		
B.1.7 Initial Issuance Appeals Process	Only one provision has been identified: Appeals would occur through processes developed by NMFS. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Any proposed revisions to fish-tickets would undergo review by state enforcement personnel prior to finalization of the revisions.		
B.1.8 Creating New IFQ Species/Species Groups After initial Implementation	Only one practical option has been identified: When a management unit is subdivided, quota shares for that unit will be subdivided by issuing quota share holders amounts of shares for the subdivisions equivalent to their holdings of the shares being subdivided. If a new management unit is established that is not a subset of an existing unit managed with IFQ, the Council will need to take action at that time to develop criteria for quota share allocation.		
B.2.0 IFQ/Permit Holding Requirements and IFQ Acquisition (After Initial Allocation)			
B.2.1 IFQ and LE Permit Holding Requirements	Catch must be covered with quota pounds within 30 days of the landing (Option 3). Only LE trawl vessels would be allowed to participate in the IFQ fishery. For any vessel with an overage (landings not covered by quota) there would be no more fishing by the vessel until the overage is covered. Additionally, for vessels with an overage, the limited entry permit cannot be sold or transferred until the deficit is cleared. A possible suboption would require some amount of quota pounds be held prior to departure from port (to be analyzed).		
B.2.2 Annual IFQ Issuance			
B.2.2.1 Start-of-Year Quota Pound Issuance	Only one practical option has been identified: Quota pounds are issued annually to share holders based on the amount of quota shares they held. (Quota shares are issued at the time of initial IFQ allocation).		

	IFQ Program A	IFQ Program B	IFQ Program C
B.2.2.2 Rollover (Carryover) of Quota Pounds to a Following Year			
Non-overfished Species	10% rollover for non-overfished species (Option 3)	30% rollover for non-overfished species (Option 5)	5% rollover for non-overfished species (Option 2)
Overfished Species	5% rollover for overfished species (Option 3)	Full (30%) rollover allowance for overfished species (Option 5)	No rollover allowance for overfished species (Option 2)
B.2.2.3 Quota Share Use-or-Lose Provisions	Do not include a use-or-lose provision but evaluate need as part of future program reviews (Option 3).		
B.2.2.4 Entry Level Opportunities for Acquiring Quota Shares and Low Interest Loan Options	No special provisions.	No special provisions.	Provide new entrants an opportunity to qualify for revoked shares and shares lost due to non-use (if such non-use provisions are created) (Element 2)
B.2.2.5 Community Stability Hold Back	No special provisions.	No special provisions.	Set aside up to 20% of the non-whiting shoreside trawl sector allocation each year and allocate to IFQ holders who have submitted proposals, ranked on the basis of objective criteria that evaluate benefits to local communities.
B.2.3 Transfer Rules			
B.2.3.1 Eligible Owners/Holders (Who May Own/Hold)	Any entity eligible to own or operate a US documented fishing vessel. (Option 2) *The Trawl IQ Committee's intent is to preserve opportunity for existing participants*		
B.2.3.2 Duration of Transfer - Leasing and Sale	Permanent transfers and leasing of quota shares and quota pounds allowed. (Option 2)	Permanent quota share transfers only--leasing prohibited. Permanent transfers and leasing of quota pounds allowed. (Option 1)	Same as Program A
B.2.3.3 Limits on Time of Transfer	Allow transfers of quota shares any time during year (Option 1).	Prohibit transfer of quota shares during the last two months of the year.	Same as Program A
B.2.3.4 Divisibility	Only one practical option has been identified: Quota Shares: nearly unrestricted divisibility - "many decimal points." Quota Pounds: divisible to the single pound		
B.2.3.5 Liens	No options have been proposed to restrict liens. Liens can and should be facilitated through a central lien registry. Options for the central lien registry are covered in Section B.3.1.		

	IFQ Program A	IFQ Program B	IFQ Program C
B.2.3.6 Accumulation Limits	50% or No Limits (Option 5).	Consider all limits as sub-options	Most restrictive limits (1% or 5%) **OR** Intermediate level limits (10% or 25%)
B.2.3.7 Vertical Integration Limit	Only one option has been identified: No additional limits on vertical integration beyond those already provided through accumulation limits.		
B.3.0 Program Administration			
Tracking IFQ, Monitoring Landings, and Enforcement (see Table B.3-1)			
Enforcement Program Number	**Enforcement Program 2**	**Enforcement Program 1**	**Enforcement Program 3**
At-Sea Monitoring	100% at-sea monitors (observers)	100% at-sea monitors (observers)	100% at-sea monitors (observers) or cameras
Shoreside Monitoring	Shoreside monitoring opportunity would be provided	100% shoreside monitoring	Shoreside monitoring opportunity would be provided
Retention and Discards	Discards allowed	Full retention required	Discards allowed if at-sea monitor is present (otherwise full retention)
Discard Monitoring and Reporting System	Upgraded discard (bycatch) monitoring and reporting system needed	An upgraded discard monitoring and reporting system is un-needed	Upgraded discard (bycatch) monitoring and reporting system needed
Electronic Reporting	Electronic landings tracking. QS reported electronically.	Electronic landings tracking. QS reported electronically.	Parallel federal electronic landings tracking. QS reported electronically.
Landing Notification	Advance notice of landing required.	Advance notice of landing required	Advance notice of landing required
Potential Landing Times	Unlimited landing hours	Limited landing hours	Unlimited landing hours
Potential Landing Sites	Licenses required for delivery sites	Unlimited landings sites	Licenses required for delivery sites
Vessel Monitoring System (VMS)	VMS Required under all programs	VMS Required under all programs	VMS Required under all programs
Quota Share Tracking	Create a central lien registry but exclude all but essential ownership information. (Option 2).	Create a central lien registry including all related ownership information (Option 1).	Create a central lien registry including all related ownership information (Option 1).

	IFQ Program A	IFQ Program B	IFQ Program C
B.3.2 Cost Recovery/Sharing and Rent Extraction	Cost recovery for management (not enforcement or science). Up to 3% of ex-vessel value, the limit specified in the Magnuson-Stevens Act.	Same as Program A	Full cost recovery: Landings fee plus privatization of elements of the management system. In particular, privatization for monitoring of IFQ landings (e.g., industry pays for their own compliance monitors). Stock assessments should not be privatized and the electronic fish ticket system should not be privatized.
B.3.3 Program Duration and Procedures for Program Performance Monitoring, Review, and Revision (Magnuson-Stevens Act (d)(5)(A))	A four year review process is specified along with review criteria. Among other factors, the review would include evaluation of whether or not there are localized depletion problems and whether or not quota shares are being utilized. Standard fishery management plan and regulatory amendment procedures will be used to modify the program.		
B.3.4 Data Collection	Expanded voluntary submission of economic data (Option 2).	Expanded mandatory submission of economic data (Option 1).	Same as Program B

2.2 Alternatives Considered but Excluded from Detailed Analysis

This section discusses an alternative that was considered but rejected and briefly explains the reasons for its elimination. In addition, this section lists options and sub-options that were considered by the Council and TIQC but were not included in any of the alternatives forwarded for analysis.

An alternative that was initially considered for analysis would issue IFQs for overfished species, maintain cumulative trip limits for all other species, and implement total catch reporting and 100 percent at-sea monitoring. Upon further consideration it was determined that this alternative would not have the potential to create enough benefits to the groundfish fishery to offset the costs of the monitoring and reporting requirements, and questions were raised as to how the program would continue once overfished species recovered. Therefore, the alternative was dropped from further consideration.

In addition to the dropped alternative, a number of options and sub-options were discussed by the Council and TIQC but not included in the alternatives forwarded for analysis. The list below provides an initial summary of these excluded elements and options.

- Species groups that could be managed under an IFQ program but were not explicitly included
    - Overfished Species
    - Prohibited Species
- Stakeholder groups that were not included as recipients of QS
    - Vessel crew members and skippers
    - Vessel owners
    - Communities
- Methods for issuing QS that were not included
    - Auctions
    - Lotteries
    - Equal shares
    - QS based strictly on years of participation
- Types of shares from an IFQ program that might have been forwarded but were not
    - Shares for Processing (as opposed to IFQs for harvesting issued to processors)

While the elements and options listed above were not specifically included in the suite of alternatives that were forwarded for full analysis, all are included in the description of components, elements and options (Section 2.3).

2.3 Components Table

Before the effects of the alternatives on resources and stakeholders of concern can be fully evaluated a number of issues need to be addressed and decisions may need to be made by the Council. The Components Table below highlights these issues by augmenting the basic alternatives forwarded by the Council for detailed analysis. The major goal of the Components Table and the Components Analysis (see Appendix C: Components Analysis) is to ensure that the details of each alternative are adequately considered by clearly specifying how the different elements fit together within an alternative and identifying unknown or unintended potential effects on resources and stakeholders groups. The Components Table and Components Analysis also identify options that were discussed but not brought forward for detailed analysis.

Several key terms used within the Components Table are defined below:

Components: Components focus on major programmatic issues within the alternatives.

Elements: Elements are single decision-points within a component. In order for an alternative to be completely defined, a decision must be made for each element.

Options: Options define the basic choices within each element. Generally options are mutually exclusive of other options, but it is noted when more than one option can be selected.

Sub-options: Sub-options provide further refinement of the options. Decisions with respect to sub-options need only be made if the particular option is chosen.

The PFMC and the Consulting Team are in the process of revising earlier versions of the Component Table, and consequently the full table is unavailable at this time. The full table will be included in the final draft. The Components Table is divided into two sections—the first section (which is included in this draft) identifies components, elements and options pertaining to the day-to-day management regime under each alternative. The second section (which is not yet available) will identify components, elements and options pertaining to the allocation of IFQs under Alternatives 2 – 4.

Table 2-3. Components, Elements, and Options Relating to Alternative Management Regimes

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Component 1 Catch Control Tools *In this component the primary catch control rules are specified but not generally the species to which they apply.*					
Element 1.1 IFQ Program. The specific design elements of each of these IFQ program are provided in Table 22 and 2-4. *Alternative 3 will be analyzed with each IFQ program (Alternative 3A, 3B, and 3C) in order to compare and contrast the differences while holding other aspects of the management regime constant.*					
Option 1.1.1 No IFQ Program	☑	☐	☐	☐	☑
Option 1.1.2 IFQ Program A GENERAL DESCRIPTION (See Tables 2-2 and 2-4)	☐	☑	☑	☐	☐
Option 1.1.3 IFQ Program B GENERAL DESCRIPTION (See Tables 2-2 and 2-4)	☐	☐	☑	☐	☐
Option 1.1.4 IFQ Program C GENERAL DESCRIPTION (See Tables 2-2 and 2-4)	☐	☐	☑	☑	☐
Element 1.2 Permit Stacking.					
Option 1.2.1 No Permit Stacking	☑	☑	☑	☑	☐
Option 1.2.2 Permit Stacking A vessel receives one whole set of trip limits issued for each of a maximum of 3 permits attached to the vessel. Only one of the permits attached to the vessel would need to be of the appropriate length. The cumulative limits would continue to be for 2 months periods.	☐	☐	☐	☐	☑
Element 1.3 Cumulative Trip Limits GENERAL DESCRIPTION					
Option 1.3.1 Cumulative Landing Limits. Vessels reaching their cumulative landing limits may continue to fish but must discard fish in excess of the landing limit. Season closures are be implemented for the affected species when the fleet reaches its cap for that species.	☑	☐	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

– **Key to Column Indicators** – ☑ = this option is included in alternative; ☐ = option could be included but is not; **N/A** = option is not applicable to alternative

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Option 1.3.2 Cumulative Catch Limits: Vessels reaching their cumulative catch limits must stop trawling in strategies which may encounter species for which the catch limit has been reached. Within the catch limits, there may be retention limits that vary based on biennial management decisions. A season closure will be implemented for the affected species when the fleet reaches its cap for that species. Note: this option requires 100% catch monitoring. *Under the alternatives that use cumulative catch limits, the limits are not applied to species managed with IFQ (except that whiting taken in non-whiting fisheries may be subject to both the cumulative limit and the IFQ requirement, and under Alternative 3 an IFQ species may be managed with nontransferable cumulative limits instead of IFQ under low OY conditions—see Component 2).*	☐	☑	☑	☑	☑
Sub-Option 1.3.2.1 Transferable separate from the permit, but nontransferable: (1) for whiting; and (2) for low OY species managed with cumulative limits Vessels which reach their cumulative limits may continue fishing if they acquire additional cumulative limits. All cumulative limit transfers are temporary (i.e. a cumulative limit reverts to the original permit at the end of the year). Partial transfers may be allowed if the cumulative limit period is longer than 2 months. Consider the need for a limit on stacking. *(Whiting cumulative limits apply at all times to the non-whiting shoreside sector and to the shoreside whiting sector when the whiting season is closed See Component 2).*	☐	☑	☐	☐	☐
Sub-Option 1.3.2.2 Not transferable except with the transfer of the permit.	☑	☐	☑	☑	☑
Element 1.4 Adjustments for Low OY Management Under status quo and all alternatives, the Council may suspend intersector allocations when a species is overfished. *The option choices are whether or not to adjust the catch control rules under low OY conditions and, if so, the threshold or procedure for determining when to apply low OY adjustments. The adjustments that would be made under low OY conditions are specified in Element 2.2 through Element 2.4. In general the adjustments for low OY conditions are as follows: under Alternative 2, switch from transferable cumulative limits to nontransferable cumulative limits; and, under Alternative 3, switch from IFQ management to management with nontransferable cumulative limits, except for whiting.*	☑	☑	☑	☑	☑

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Option 1.4.1 **Low OY managemen**t. When the OY is unusually low catch control rules may be changed. [NOTE: Either of the following suboptions can be matched with an alternative that includes low OY management adjustments.]	N/A	☑	☑	☐	N/A
Sub-Option 1.4.1.1 Establish a threshold at which point a species would switch from incidental catch management to "low OY management." ($B_{25\%}$).	N/A	☑	☐	☐	N/A
Sub-Option 1.4.1.2 Decide on application of "low OY management" as part of the biennial specifications process.	N/A	☐	☑	☐	N/A
Option 1.4.2 **No low OY management** provisions, (other than the existing Council discretion to suspend allocations for overfished species).	N/A	☐	☑	☑	N/A
Element 1.5 **General season closure:** When all sectors reach the overall OY for a species, the fisheries catching that species close.	☑	☑	☑	☑	☑
Element 1.6 **Whiting season openings.**					
Option 1.6.1 Staggered season openings for each whiting sector set during the biennial specifications process.	☑	☐	☐	☐	☑
Option 1.6.2 Continuation of spring opening for the season, to control impacts on ESA listed salmon.	☐	☑	☑	☑	☐
Option 1.6.3 Opens January 1.	☐	☑	☑	☑	☐
Element 1.7 **Whiting season closings.** *During closed periods there is generally a whiting cumulative limit of 20,000 pounds per week for shoreside whiting deliveries (no at-sea deliveries are allowed).* *(Note: Under Alternative 2 whiting is controlled by IFQs. Under Alternative 3 and 4 catch of all groundfish species is controlled through IFQs, except "Other Fish" under Alternative 3.)*					
Option 1.7.1 Whiting season closes for a sector on attainment of whiting allocations or on attainment of catch caps for bycatch species with caps.	☑	☐	☐	☐	☑
Option 1.7.2 Whiting season closure on attainment of bycatch caps for species with bycatch cap	☐	☑	☐	☐	☐
Component 2 **Sector Species Combinations Trips** are assigned to a sector based on delivery location and species composition. Whiting trips in the shoreside fishery are those OPTION A: with more than 50% whiting, OR OPTION B more than 50% whiting and greater than 10,000 pound of whiting. *For the remainder of the document it is assumed that Option A applies.*					

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

– **Key to Column Indicators** – ☑ = this option is included in alternative; ☐ = option could be included but is not; **N/A** = option is not applicable to alternative

Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Element 2.1 Trawl Sectors.					
Option 2.1.1 Specify three sectors: ☐ Shoreside deliveries -- all limited-entry trawl deliveries to shoreside processors ☐ Mothership deliveries -- all limited-entry trawl deliveries to motherships ☐ Catcher-processor deliveries – all harvests by catcher processors	☑	☐	☑	☐	☑
Option 2.1.2 Specify four sectors: ☐ Shoreside whiting deliveries -- all limited-entry trawl deliveries of whiting to shoreside processors. ☐ Shoreside non-whiting deliveries -- all limited-entry trawl deliveries to shoreside processors for trips on which whiting comprises less than 50% of the catch. ☐ Mothership deliveries -- all limited-entry trawl deliveries to motherships ☐ Catcher-processor deliveries -- all harvests by catcher processors *Other elements under this component specify the following catch control rules for the Alternative 2 shoreside whiting and non-whiting landings (summarized here).*	☐	☑	☐	☐	☐
Option 2.1.3 Specify one trawl sector: This sector includes all deliveries and harvests of limited-entry trawl vessels.	☐	☐	☐	☑	☐

Sector	*Trip Classification & Whiting Catch Control*	*Other Species Catch Control*
Shoreside Whiting	*>50% of the catch is whiting. Shoreside whiting sector IFQ is required to cover whiting catch.*	*Sector cap—closure on reaching limit.*
Shoreside Non-whiting	*<50% of the catch is whiting. Shoreside non-whiting sector IFQ is required to cover the whiting catch AND catch in excess of the cumulative landing limits constitutes a violation.*	*IFQ required for trawl target and allocated species. Cumulative limits for unallocated and incidental catch (transferable or nontransferable depending on OY conditions).*

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Element 2.2 Catch Control for Trawl Target and Allocated Species (Except Whiting) Trawl target species are defined as those species for which trawlers took over 90% of the harvest from 1994 through 2004. Sablefish; Dover sole; Yellowmouth Rockfish; Sharpchin Rockfish; Arrowtooth Flounder Splitnose Rockfish (Monterey and Conception); Petrale Sole; English Sole; Pacific Cod; Pacific Ocean Perch; Other Flatfish Complex Longspine thornyhead; Dark-blotched Rockfish Other species may be targeted by trawl and other sectors or taken incidentally in the trawl fishery. These species are also included in the Element 2.2 management category, if a trawl allocation is established. *For the purpose of analysis the species assumed to fall into this category are specified in Section 2.x.x.*						
Option 2.2.1	All sectors: cumulative landing limits On attainment of a cap, guideline or OY for a particular species, the segments of the trawl fishery that might catch that species are closed. Cumulative limits are adjusted to meet season duration objectives (usually a year-round fishery, except for whiting). Whiting Fishery: Cumulative landings limits for non-whiting species. For non-whiting species for which whiting fishery caps have been established, the whiting season closes on attainment of the non-whiting catch cap. For species without whiting fishery caps, the cumulative limits that apply to all trawl vessels are set taking into account catch projections for the whiting fishery. Greater than expected catch in the whiting fishery may result in the downward adjustment of those limits.	☑	☐	☐	☐	☐
Option 2.2.2	Shoreside non-whiting sector IFQs: No special management under low OY conditions. Whiting fishery: shoreside, mothership, & catcher-processor whiting sectors. Each whiting sector will have a cap for each trawl target and allocated species/species group. A whiting sector will close if its cap is reached for a non-whiting species. For whiting deliveries, there will be no cumulative catch limits for non-whiting species. A procedure will be established under which all or a portion of an unused cap species may be rolled-over/transferred to another sector. More specificity needed (timing and criteria similar to that used for the current whiting rollover, rollover to a non-whiting sector)? Any person may acquire non-whiting IFQ from the shoreside non-whiting sector and designate that it be used to increase the cap for a particular sector of the whiting fishery, for the common benefit of all members of that sector. *NOTE: In the extreme IFQ transfers could lead to whiting sector targeting on a non-whiting species.*	☐	☑	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Option 2.2.3 All Sectors: sector specific IFQs (i.e. not transferable from one sector to another See Element 1.4)	☐	☐	☑	☐	☐
Sub-Option 2.2.3.1 Under low OY conditions, switch to nontransferable cumulative catch limits. All poundage that would otherwise have been issued to holders of quota shares will be used to create a catch cap. Nontransferable cumulative limits will be used to achieve Council season duration goals. (See Element 1.4)	☐	☐	☑	☐	☐
Sub-Option 2.2.3.2 No special measures for low OY conditions (i.e. continue using IFQs) (See Element 1.4)	☐	☐	☑	☐	☐
Option 2.2.4 IFQs	☐	☐	☐	☑	☐
Option 2.2.5 Cumulative catch limits with permit stacking rules applied for non-whiting trips. For the whiting fishery, same as Option 2.2.1 except that cumulative limits are catch limits rather than landing limits. Permit stacking rules do not apply to non-whiting species taken on whiting trips, i.e. on whiting trips a vessel receives no credit for permit stacking.	☐	☐	☐	☐	☑
Element 2.3 **Whiting.** There would be an annual allocation of whiting for each sector specified under the alternative, except under Option 2.3.4. A vessel is considered to be participating in a shoreside whiting trip if its landing (Alternative 1) or catch (Alternatives 2 through 5) for a trip is composed of more than 50% whiting.					
Option 2.3.1 All sectors: whiting season (no vessel landing limits). Outside the whiting season, cumulative whiting landing limits for shoreside deliveries and no at-sea delivery allowed. Whiting season start dates for each sector are set during the biennial specifications process. Each sector's season closes when that sector's allocation has been caught. If it appears that a sector's whiting allocation will not be caught during the sector's whiting season, then on or after September 15, the portion of the sector's whiting allocation that is projected to go unused may be rolled over for use by other sectors.	☑	☐	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Option 2.3.2 Shoreside, mothership, & catcher-processor whiting sectors: IFQs during whiting season (season may be year-round, see Element 1.6 and Element 1.7). If needed for salmon ESA or other purposes, whiting season start dates for each sector would be set during the harvest specifications process. When the whiting season is closed, whiting may be delivered shoreside as part of the non-whiting fishery so long as it does not constitute a whiting trip (whiting comprises less than 50% of the catch for the trip), shoreside whiting cumulative catch limits are not violated, and the catch is covered by IFQ issued for the non-whiting shoreside sector. Any other groundfish species caught with the whiting must be caught and landed consistent with all other rules that apply to the shoreside non-whiting sector (Option 2.2.2, Option 2.4.2, and Option 2.5.2).	☐	☑	☐	☐	☐
Sub-Option 2.3.2.1 Whiting IFQ may not be transferred from one sector to another.	☐	☑	☐	☐	☐
Sub-Option 2.3.2.2 Whiting IFQ may not be transferred from one sector to another. However, there may be a midseason transfer of unused IFQ from one sector to another. Criteria for transfers, amount, and sectors to which the transfer would be made need to be specified. **Example 1.** After a certain date (initially September 15, but modifiable as part of the annual specifications process), if more than 25% of the whiting IFQ/quota pounds (see **Table 2-4** for a description of the quota share/quota pound IFQ system) for a sector remain unused, a portion of the quota pounds for the sector may be redesignated for use by any sector (i.e. the IFQ may be transferred to a different owner/vessel, or used by the same vessel operating in a different mode, for example, a catcher vessel switching from mothership to shoreside deliveries). The redesignation will not change the ownership of the quota pounds but quota pounds may be transferred after the redesignation. If a sector qualifies for quota pound redesignation then (OPTION A, up to 50% of the unused quota pounds; OR OPTION, B 50% of the quota pounds for the year) associated with each account may be redesignated for use in any sector. **Example 2.** As of a certain date (initially September 15, but modifiable as part of the annual specifications process), any account in which more than 25% of the whiting quota pounds for the year remain unused will forfeit those pounds in excess of 25% for redistribution (except for non-whiting shoreside quota pounds, i.e. those whiting pounds designated to cover bycatch in the non-whiting fishery). Forfeited quota pounds shall be redistribute (1) equally among other whiting quota pound accounts for vessels with whiting for the same sector, where the holder of such an account has applied for the redistribution; OR (2) proportionally to the whiting quota pounds for the year held in other quota pound accounts for vessels with whiting for the same sector, where the holder of such an account has applied for the redistribution; OR (3) via auction (if auctions are allowed and only if the proceeds are dedicated directly to defrayal of TIQ program costs) or, if auctions are not allowed or funds cannot be dedicated, via a lottery among vessel quota pound accounts registered for the lottery. If there is not sufficient interest in using whiting quota pounds for the sector for which they were originally issued the quota pounds may be redesignated for use by any trawl sector. Whiting quota	☐	☑	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
pounds redistributed, via any means except auction may (may not) be transferred from the vessel account to which they are assigned (but may be voluntarily relinquished for redistribution). [NOTES: "Quota pounds for the year" means all quota pounds used by the account during the year plus any unused quota pounds remaining in the account. To avoid forfeiture, accounts not associated with vessels would have to transfer all of their quota pounds to a vessel account because quota pounds can only be used in association with a vessel account.]					
Option 2.3.3 Sector specific IFQs during the whiting season. Outside the whiting season, cumulative whiting catch limits for shoreside deliveries and no catch for at-sea delivery allowed. If needed for salmon ESA or other purposes, whiting season start dates for each sector would be set during the biennial specifications process.	☐	☐	☑	☐	☐
Option 2.3.4 IFQ (no division of the trawl sectors, see Option 2.1.3). Whiting season. Outside the whiting season, whiting may still be caught using IFQs, but catch is also constrained by whiting cumulative catch limits and at-sea delivery is not allowed. If needed for salmon ESA or other purposes, whiting season start dates for each sector would be set during the harvest specifications process.	☐	☐	☐	☑	☐
Option 2.3.5 Same as Option 2.3.1 except that whiting cumulative limits are catch limits rather than landing limits. Permit stacking rules do not apply to whiting cumulative catch limits.	☐	☐	☐	☐	☑
Element 2.4 Unallocated Shared Target and Incidental Species Currently Managed With Cumulative Limits *For purposes here, "Shared target species" are those for which trawlers take less than 90% of the catch but at greater than incidental levels. Shortspine thornyheads is an example of a currently unallocated shared target species. Because unallocated shared target and unallocated incidental species are grouped together for management, a specific definition of incidental species is not provided here. In general incidental species would be considered those species which do not provide a significant economic incentive for the particular targeting strategy employed by trawl vessels.*					
Option 2.4.1 All sectors: cumulative landing limits (including whiting deliveries) On attainment of a cap, guideline or OY for a particular species, the segments of the trawl fishery that might catch that species are closed. Whiting fishery: Cumulative landing limits apply to non-whiting species. It is unlikely that a whiting fishery cap would be established for an unallocated non-whiting species, however, if that situation were to occur, the whiting season would close on attainment of the non-whiting cap. For species without whiting fishery caps, the cumulative limits that apply to all trawl vessels are set taking into account catch projections for the whiting fishery. Greater than expected catch in the whiting fishery may result in the downward adjustment of those limits.	☑	☐	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Option 2.4.2 Shoreside non-whiting deliveries: Cumulative catch limits, transferable separate from the permit. Under low OY conditions, the cumulative catch limits will be nontransferable. Whiting fishery: shoreside, mothership, & catcher-processor whiting sectors. If a cap were to be established for an unallocated species, there will be no cumulative catch limits for those non-whiting species with a cap. A procedure will be established under which all or a portion of an unused cap species may be rolled-over/transferred to another sector. More specificity needed (timing and criteria similar to that used for the current whiting rollover, rollover to a non-whiting sector)? For species without a cap, shoreside cumulative catch limits apply to species without a cap, except that even if cumulative limits are stacked non-whiting catch on whiting trips will be constrained to a single cumulative limit. The cumulative limits that apply to all trawl vessels are set based on catch projections for the whiting fishery. Greater than expected catch in the whiting fishery may result in the downward adjustment of those limits. No special management under low OY conditions.	☐	☑	☐	☐	☐
Sub-Option 2.4.2.1 The duration of the cumulative limit periods will remain at two months and mid-period transfers will not be allowed.	☐	☑	☐	☐	☐
Sub-Option 2.4.2.2 The duration of the cumulative limits may be set to four months and mid-period transfers allowed.	☐	☑	☐	☐	☐
Option 2.4.3 Sector specific IFQs (i.e. not transferable from one sector to another.	☐	☐	☑	☐	☐
Sub-Option 2.4.3.1 Under low OY conditions, switch to nontransferable cumulative catch limits. All poundage that would otherwise have been issued to holders of quota shares will be used to create a catch cap. Nontransferable cumulative limits will be used to achieve Council season duration goals. (See Element 1.4)	☐	☐	☑	☐	☐
Sub-Option 2.4.3.2 No special measures for low OY conditions (i.e. continue using IFQs) (See Element 1.4)	☐	☐	☑	☐	☐
Option 2.4.4 IFQs	☐	☐	☐	☑	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Option 2.4.5 Cumulative catch limits with permit stacking rules applied for non-whiting trips. On attainment of a cap, guideline or OY for a particular species, the segments of the trawl fishery that might catch that species are closed. For the whiting fishery, cumulative catch apply to non-whiting species. It is unlikely that a whiting fishery cap would be established for an unallocated non-whiting species; however, if that situation were to occur, the whiting season would close on attainment of the non whiting catch cap. Permit stacking rules do not apply to non-whiting species taken on whiting trips, i.e. on whiting trips a vessel receives no credit for permit stacking.	☐	☐	☐	☐	☑
Element 2.5 "Other Fish" Groundfish: sharks (except spiny dogfish), skates, rays, ratfish, morids, and grenadiers. *Under the current management regime these Other Species have an OY but do not have separate OYs and are not managed with cumulative trip limits. However, on occasion some of these species are considered for separate management (e.g. Pacific cod, Spiny Dogfish, cabezon and kelp greenling). As with other species groups, composition of the group will change over time. The group will be analyzed as it was composed for the 2005 fishery. If action Alternative 2, 3 or 5 is implemented the management measures used for groundfish categorized as "Other Fish" will be those in place just prior to the time of implementation, unless than Council follows other procedures to take action (e.g. modifications during the biennial specifications process). If at the time the program is implemented cumulative limits are used to manage these species, then they will be managed the same as "Unallocated Shared Target and Incidental Species" (Element 2.4). In order to accommodate the possible change in status of some members of this group and the possible need for allocation of IFQ an allocation analysis will be provided for the species most likely to be managed separately at the time of program implementation.*					
Option 2.5.1 Status Quo: monitoring only (occasional use of cumulative limits)	☑	☐	☐	☐	☐
Option 2.5.2 Monitoring only or management measures in place just prior to implementation.	☐	☑	☑	☐	☑
Option 2.5.3 IFQs	☐	☐	☐	☑	☐
Component 3 Groundfish Catch of Limited Entry (LE) Trawl Vessels Using Gears Other Than Groundfish Trawl *This component addresses the application of the management measures specified in Component 1, Component 2, and Component 4 to groundfish catch by non-trawl and exempted trawl gear used by vessels with a limited entry trawl permit. Exempted trawl gears are California halibut, Pacific shrimp, sea cucumber trawl and ridgeback prawn trawl.*					

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Element 3.1 Exempted Gear (Including Exempted Trawl Gear)					
Option 3.1.1 Exempted gear landings by LE trawl vessels counts against the LE allocation (trawl and fixed gear), with the exception of sablefish for which there is a separate LE trawl allocation against which such landings count. Landings are subject to open access (OA) cumulative limits and also count against limited entry trawl cumulative limits.	☑	☐	☐	☐	☐
Option 3.1.2 IFQ is not required for use of exempted gears. Catch counts against the OA allocation and is managed as part of the OA fishery. Some catch will be allocated from the LE trawl to OA fishery.	☐	☑	☐	☐	☐
Option 3.1.3 IFQ is required when exempted gears are used. Catch counts against the LE trawl allocation. For species for which IFQ is not required, catch counts against the trawl cumulative limits. Catch by LE trawl vessels using exempted gear must be taken in compliance with the IFQ enforcement and monitoring system and all other relevant rules applying to the IFQ, including the sector to which deliveries must be made (e.g. shoreside, mothership and catcher-processor designations).	☐	☐	☑	☑	☐
Sub-Option 3.1.3.1 Open access catch control regulations (trip limits) also apply, in addition to the IFQ requirement.	☐	☐	☑	☐	☐
Sub-Option 3.1.3.2 Open access catch control regulations (trip limits) **do not** apply.	☐	☐	☐	☑	☐
Option 3.1.4 Exempted gear catch by LE trawl vessels counts against LE allocation (trawl and fixed gear), with the exception of sablefish for which there is a separate LE trawl allocation against which such catch counts.	☐	☐	☐	☐	☑
Sub-Option 3.1.4.1 Landings are subject to open access (OA) cumulative limits and also count against limited entry trawl cumulative limits.	☐	☐	☐	☐	☑
Sub-Option 3.1.4.2 Landings are not subject open access limits. Vessels may use exempt gear to fish against the limits associated with stacked permits. Enforcement and monitoring regulations for trawl gear also apply to LE trawl vessels using exempted gear.	☐	☐	☐	☐	☑

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Element 3.2 Longline and Fishpot Gear (Fixed Gear)					
Option 3.2.1 Longline or fishpot catch by LE trawl vessels without a longline or pot endorsement counts against LE allocation (trawl and fixed gear), however, for sablefish there is a separate LE trawl allocation against which the sablefish landings count. The catch is subject to open access trip limits. Longline or fishpot catch by LE trawl vessels with a longline or pot endorsement counts against LE allocation (trawl and fixed gear), however, for sablefish there is a separate LE fixed gear allocation against which the sablefish landings count. The catch is subject to fixed gear trip limits.	☑	☐	☐	☐	☐
Option 3.2.2 IFQ is required for LE trawl vessels using longline or fishpot gear to catch species for which IFQ management is used in the trawl fishery. For species for which IFQ is not required in the trawl fishery, longline or fishpot catch counts against the trawl cumulative limits. All groundfish catch counts against the LE trawl allocation (except as noted). Catch by LE trawl vessels using longline or fishpot gear must be taken in compliance with the IFQ enforcement and monitoring system and all other relevant rules applying to the IFQ, including the sector to which deliveries must be made (e.g. shoreside, mothership and catch processor designations). An exception to this rule is provided for vessels that also have a limited entry fixed gear permit. In such case the rules are modified as specified Sub-Option 3.2.2.1 or Sub-Option 3.2.2.2.	☐	☑	☑	☑	☐
Sub-Option 3.2.2.1 For limited entry trawl vessels without a limited entry fixed gear permit, limited entry fixed gear catch control regulations (trip limits) apply and all longline and fishpot gear catch must be covered by IFQ or trawl cumulative limits. For limited entry trawl vessels that also hold a limited entry fixed gear permit, IFQ is not required to cover catch taken toward fixed gear cumulative or daily limits, catch taken toward the limits need not comply with the trawl IFQ monitoring and enforcement system, and such catch or landings count against the limited entry fixed gear allocation (i.e. for vessels with both limited entry trawl and fixed gear permits there is no opportunity to use trawl IFQ to increase harvest using longline or fishpot gear).	☐	☑	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Sub-Option 3.2.2.2 For limited entry trawl vessels without limited entry fixed gear permits, limited entry fixed gear catch control regulations (trip limits) **do not** apply and IFQ is required for all longline and fishpot gear catch. For limited entry trawl vessels with an LE fixed gear permit, IFQ is not required to cover catch taken toward the fixed gear trip limits; catch taken toward the limits need not comply with the trawl IFQ monitoring and enforcement system, and catch taken toward the limits counts against the limited entry fixed gear allocation. Longline or fishpot catch taken after fixed gear limits have been reached must be covered by IFQ or trawl cumulative limits, and be taken in compliance with the trawl IFQ monitoring and enforcement system and other relevant rules.	☐	☐	☑	☑	☐
Option 3.2.3 Longline or fishpot catch by LE trawl vessels without a longline or pot endorsement counts against LE allocation (trawl and fixed gear), however, for sablefish there is a separate LE trawl allocation against which the sablefish landings count. Longline or fishpot catch by LE trawl vessels with a longline or pot endorsement counts against LE allocation (trawl and fixed gear), however, for sablefish there is a separate LE fixed gear allocation against which the sablefish landings count. The catch is subject to fixed gear trip limits.	☐	☐	☐	☐	☑
Sub-Option 3.2.3.1 The catch is subject to open access trip limits or fixed gear limits, depending on whether or not an LE fixed gear permit is held.	☐	☐	☐	☐	☑
Sub-Option 3.2.3.2 The catch is subject to stacked trawl permit limits, and enforcement and monitoring requirements for the trawl fishery apply, except that vessels with sablefish endorsed fixed gear permits may take their tier sablefish limits and associated incidental catch under the rules which apply to the LE fixed gear fishery. The tiered sablefish limits will not count toward the trawl limits.	☐	☐	☐	☐	☑
Component 4 Monitoring and Enforcement (At-Sea Observers/Monitoring)					
Option 4.1.1 No action (status quo) monitoring and enforcement includes 100-percent observers on catcher-processors and motherships in the whiting fishery. Biological observers from the WCGOP are present for other segments of the limited entry trawl fishery. All limited entry trawl vessels carry VMS.	☑	☐	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Option 4.1.2	Detailed monitoring and enforcement programs are specified in the IFQ Program Alternatives (Programs A, B and C). These monitoring and enforcement programs include 100-percent at-sea monitoring, upgraded bycatch reporting, electronic landings reporting, shoreside monitoring of deliveries, advance notice of landing, limited delivery locations/ports, electronic IFQ tracking and continues use of VMS. Limited entry trawl vessels would be required to be in compliance with such programs any time they are harvesting against limited entry trawl catch limits, including IFQ.	☐	☑	☑	☑	☐
Option 4.1.3	In addition to the no action (status quo) monitoring and enforcement, 100-percent observers (or equivalent means of monitoring) would be required for vessels fishing on trawl cumulative limits, due to the conversion from status quo cumulative landing limits to cumulative catch limits.	☐	☐	☐	☐	☑
Component 5	**Area Management.** Decision deferred until additional information is available, e.g. preliminary DEIS is ready.					
Option 5.1.1	Species divided by areas based on stock assessment information. New area divisions created as stock assessment information indicates need.	☑	☐	☐	☐	☐
Option 5.1.2	Plan to establish additional regional management areas as needed at a later time.	☐	☑	☑	☑	☑
Option 5.1.3	Process Option: Task a group to begin considering the need for additional regional management areas (biological or socio-economic) and potential boundaries along with a process for identifying and responding to regional management area issues that may develop or become more apparent in the future.	☐	☑	☑	☑	☑
Component 6	**Sector Allocation**					
Element 6.1	**Within Trawl Allocation.** Allocation among limited entry trawl sectors.					
Option 6.1.1	Whiting allocation rules. No other within trawl allocations.	☑	☐	☐	☐	☑

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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Section 1: Components, Elements, and Options Relating to Management Regimes	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Option 6.1.2 Establish the allocation among trawl sectors based on each sector's relative shares during the time period used for initial IFQ allocation. If different periods are used for different trawl sectors calculate the share for each sector based on its IFQ allocation period, then adjust all percentages proportionately such that they sum to 100%.	☐	☑	☑	☑	☐
Sub-Option 6.1.2.1 Apply a recency requirement such that the catch history of any vessel which does not meet the recent participation requirement (if any) for the initial allocation is not included in the calculation of sector shares.	☐	☑	☑	☑	☐
Sub-Option 6.1.2.2 Do not apply a recency requirement.	☐	☑	☑	☑	☐
Option 6.1.3 Establish the allocation among trawl sectors based on each sector's relative shares during the time period used for initial IFQ allocation. If different periods are used for different trawl sectors use the shortest period common to the allocation formula for all sectors.	☐	☑	☑	☑	☐
Sub-Option 6.1.3.1 Apply a recency requirement such that the catch history of any vessel which does not meet the recent participation requirement (if any) for the initial allocation is not included in the calculation of sector shares.	☐	☑	☑	☑	☐
Sub-Option 6.1.3.2 Do not apply a recency requirement.	☐	☑	☑	☑	☐
Element 6.2 **Trawl/Non-trawl Allocation.** Allocation between limited entry trawl and all other sectors, recreational and commercial)					
Option 6.2.1 Establish needed intersector allocations through the intersector allocation process. (NOTE: Intersector allocations are needed for implementation of Amendment 18).	☑	☑	☑	☑	☑
Element 6.3 **Trawl/Open Access Allocation.** Adjustment of allocation between limited entry trawl and open access gears to account for change in catch accounting rules.					
Option 6.3.1 Augment the open access allocation to account for trawl vessels fishing with open access gear on the open access allocation (Option 3.1.2)	☐	☑	☐	☐	☐

– **Key to Alternatives**

– Alt. 1: No Action; Cumulative trip limits; Whiting season; Only report landings	– Alt. 2: Trawl Target IFQs, Whiting season; Total catch reporting	– Alt. 3: IFQs for all but Other Species, No whiting seasons; Total catch reporting	– Alt. 4: IFQs for all species, No whiting seasons; Total catch reporting	– Alt. 5: Permit stacking; trip limits; Whiting season; Total catch reporting

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This section of the Components Table [IN PROGRESS, TO BE PROVIDED AS PART OF FINAL REPORT] deals with the initial allocation QS and the annual allocation of QP. QS differ from QP in that QP represent an annual catch amount allocated to a person, whereas a persons' QS represent portions of the total pool of quota shares (QSP).

The allocation of QS is typically based on historical participation. For example, under one option, a harvester's QS would be based on the total of all pounds landed under the permit from 1994 – 2003 after dropping the two worst years. For a given year, QP for a species are an individual's QS as a percent of all quota shares issued for that species, multiplied by the sector allocation for that species for that year. It should be noted that QS need not be based on catch history. For example each participant could be issued 1,000 QS for every year they fished, or each participant might be issued 10 QS of species Y for every 100 pounds of species X. The former method might be used if documentation of historical participation is suspect, while the latter might be used to issue quota shares for incidental species that fishers were trying to avoid.

The West Coast Trawl IFQ Program has several complicating features. One such feature is that multiple groups could be issued QS, and the proportion of QS going to each group may be predetermined. There are also options that would use different catch history periods for the different groups. While this type of allocation is complicated, it should not be considered a stumbling block if decision makers have predetermined the proportion that would go to each group. Assume for example that Group X's QS are allocated based on landings from one set of years—say 1994 – 2003, and Groups Y's QS are based on a different set of years 2000 – 2004. Furthermore, assume that both groups are to be allocated 50 percent of the QS; the total amount of history for a particular species over all members Group A was 10 million pounds, and the total amount for Group B was 4 million pounds. If Group A's history is divided by 10 and Group B's history is divided by 4, and quota shares are issued based on the result, then each group would receive 1 million QS, thus assuring that each group gets 50 percent of the allocation.

Another complicating feature of the Trawl IFQ Program is the fact that the reporting system for shoreside deliveries shows the total amount landed rather than total amount caught. For target species, or for species that are not constraining to the fishery, it is likely that landings are approximately equal to total catch. But for many incidental catch species (e.g., those with low value) or overfished species that constrain the fishery, landings may be a very poor indicator of historical catch. Furthermore, even if all catch of incidental species were reported, it may not be reasonable to award QS of incidental species based on historical catches. Assume for example there are two fishers A and B. Fisher A is very methodical and works hard to avoid incidental catches and lands 100 pounds of incidental catch for every 1,000 pounds of target catch. Fisher B is a less careful fisher and lands 600 pounds of incidental catch for every 1,000 pounds of target. If landing history were used for incidental catch, then Fisher B would get significantly more QS than Fisher A, and in a sense would be rewarded for not fishing cleanly. From this perspective it may be more equitable to consider methods other than historical landings to issue quota shares for incidental or overfished species.

The remainder of this section is structured as a table similar to the previous section. It should be noted that QS are only applicable to Alternatives 2 – 4. It should also be noted that the Council developed three basic programs for issuance of QS—Program A, Program B and Program C. In the main suite of alternatives, Program C was matched with Alternatives 2, 3 or 4 for analysis, while Programs A and B were matched with Alternative 3. The application of each of the programs to Alternative 3 creates three full sub-alternatives for Alternative 3. The intent of was to allow the alternatives to be compared with one another using the same IFQ program, and to allow the various programs to be compared using the same main alternative. With this approach, the Council hopes the information necessary to choose between any combination of management alternatives and IFQ programs will be generated.

Table 2-4. Components, Elements, and Options Relating to the Allocation QS and QP

Table 4 will go here.

2.4 Summary of Direct, Indirect and Cumulative Effects of Alternatives

This section provides an overview of the direct, indirect and cumulative effects of each alternative on the resource and stakeholder groups of concern. The discussion of the impacts of the alternatives is limited to a concise descriptive summary of such impacts in a comparative form, including charts or tables, thus sharply defining the issues and providing a clear basis for choice among alternatives. The information presented is based on the scientific analysis of the direct, indirect and cumulative effects of each of the alternatives presented in Chapter 4.

2.4.1 Alternative 1: The No-Action Alternative

2.4.2 Alternative 2: IFQs for Whiting and Trawl Target Species

2.4.3 Alternative 3: IFQs for All Groundfish except Other Species

Alternative 3 consists of five major options. The options vary by the allocation rules used. Because it is expected that the initial allocation of IFQs will one of the most important impact mechanisms, the Consulting Team believes it is important to treat each of these major options as a stand-alone alternative in the effect analysis. This treatment is exemplified in Table 2-5, in which each of five options for Alternative 3 is included with a separate column.

It should be noted that Alternative 3C was designed by the Council to be somewhat of lynchpin or central cohesive option among the seven IFQ permutations in the main suite of alternatives; each of the Alternative 3 options differ only in the initial allocation rules, while both Alternative 2 and Alternative 4 use the same initial allocation rules as used in Alternative 3C.

2.4.3.1 Alternative 3A: IFQ for all but Other Species with 50/50 QS Allocation Split between Harvesters and Processors

2.4.3.2 Alternative 3Ba: IFQ for all but Other Species with a 100/0 QS Allocation Split between Harvesters and Processors

2.4.3.3 Alternative 3Bb: IFQ for all but Other Species with a 90/10 QS Allocation Split between Harvesters and Processors

2.4.3.4 Alternative 3Bc: IFQ for all but Other Species with a 50/50 QS Allocation Split between Harvesters and Processors for Whiting and a 100/0 Split for Non-whiting

2.4.3.5 Alternative 3C: IFQ for all but Other Species with 75/25 QS Allocation Split between Harvesters and Processors

2.4.4 Alternative 4: IFQs for All Groundfish Species

2.4.5 Alternative 5: Permit Stacking

2.5 Comparison of the Direct, Indirect and Cumulative Effects of the Alternatives

Table 2-5 provides brief narrative descriptions of the major direct and indirect effects of each alternative. The rows in the table list the stakeholder and resource groups that have been initially identified as being possibly affected by the alternatives. The columns in the table list the alternatives. The various options for Alternative 3 are treated independently because the impacts of the initial allocation rules in the IFQ programs may differ. Table 2-6 provides brief narrative descriptions of the cumulative effects of the alternatives.

Table 2-5. Comparison of the Direct and Indirect Effect of the Alternatives

	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Stakeholder & Resource Groups					**Narrative Description of Effects**				
Trawl Catcher Vessels									
Trawl Catcher Processors									
Processors of Trawl Groundfish									
Non-Trawl Commercial Harvesters									
Buyers and Processors that do Not Purchase Trawl Groundfish									
Recreational Harvesters of Groundfish									
Communities									
Tribes									
Input Suppliers									
Wholesalers and Retailers									
Consumers									
General Public									
Management agencies									
Groundfish Resources									
Other Fish Resources									
Marine Mammals									
Seabirds									
Other Protected Resources									
Habitat									
Trophic Relationships									

Table 2-6. Comparison of the Cumulative Effects of the Alternatives

	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Stakeholder & Resource Groups					**Narrative Description of Effects**				
Trawl Catcher Vessels									
Trawl Catcher Processors									
Processors of Trawl Groundfish									
Non-Trawl Commercial Harvesters									
Buyers and Processors that do Not Purchase Trawl Groundfish									
Recreational Harvesters of Groundfish									
Communities									
Tribes									
Input Suppliers									
Wholesalers and Retailers									
Consumers									
General Public									
Management agencies									
Groundfish Resources									
Other Fish Resources									
Marine Mammals									
Seabirds									
Other Protected Resources									
Habitat									
Trophic Relationships									

3 Resource and Stakeholder Profiles

3.1 Introduction

This chapter provides profiles of affected resource and stakeholder groups. Included are definitions of historical and baseline conditions. The profiles document the current conditions and historical context of resource and stakeholder groups as measured by specified quantitative or qualitative indicators. The profiles describe how resource and stakeholder groups have changed, and how they are changing at the time of the analysis. This description of the affected environment will not only provide the needed baseline to evaluate the environmental consequences of the alternatives, but also will help identify past and present actions contributing to cumulative effects.

3.1.1 Historical Conditions

These are conditions of the resources and stakeholder groups as reflected in the indicator values for previous years. Trends in conditions are identified where possible, and the important cause-and-effect relationships between past actions and the condition of resources and stakeholder groups of concern are described to the extent possible.

3.1.2 Baseline Conditions

This description of baseline conditions reflects the status of potentially affected resource and stakeholder groups as of 2005. To the extent feasible, trends data from the description of historical conditions are used to depict baseline conditions more accurately (i.e., by incorporating variation over time). The cumulative past and present effects of groundfish fishery activity, as well as effects external to the groundfish fishery such as other fishery impacts, human-induced impacts, and climatic events influencing the resource and stakeholder groups, all contribute to the state of the baseline condition. In terms of regulations, the baseline includes all existing regulations as modified by actions that the Council has approved, but which have not yet been implemented by NMFS. Thus, any new regulations implementing the Essential Fish Habitat measures approved in Amendment 19 are assumed to be in effect, as are the sector allocations authorized under Amendment 18.

The baseline conditions provide a benchmark against which the effects of the alternatives are compared in Chapter 4.

3.2 Major Fishery Data Sets Used in Describing Historical and Baseline Conditions

This section briefly describes some of the major data sets available for defining the historical and baseline conditions.

3.2.1 Shoreside Non-whiting Commercial Fishery Data

Several harvest monitoring systems are used in West Coast groundfish management. PacFIN (Pacific Fisheries Information Network) is the commercial monitoring database for shoreside landings. Summaries of logbook entries are also available for catch of limited entry trawl fleet. Discards by the shoreside fleets are sampled by the West Coast Groundfish Observer Program (WCGOP). These three data sources are all incorporated into the bycatch models constructed and maintained by the PFMC Groundfish Management Team (GMT). NorPac collects and summarizes catch by the at sea whiting fleets.

3.2.1.1 Landings Data

Commercial landings are recorded on state fish-tickets. Poundage by sorted species category, price, area of catch, vessel identification number, port of landing, buyer and other data elements are recorded on fish-tickets. Landings are sampled in port by state personnel to collect species composition data for aggregated species categories, and other biological data. Species composition ratios are used to disaggregate landings data for certain species categories. Limited entry groundfish trawl vessels are also required to maintain logbooks that record the start location, time, and duration of trawl tows, as well as the total catch by species market category. Data from fish-tickets and logbooks are available at various level of summarization from PacFIN.

3.2.1.2 Discards and Incidental Catch Data

The Groundfish FMP requires all vessels that participate in the groundfish fishery to carry an observer when notified to do so by NMFS or its designated agent. Under the WCGOP, observers monitor and record catch data, including species composition of retained and discarded catch. Observers also collect biological data such as fish length, sex, and weight. The program deploys observers coast wide on permitted trawl and fixed-gear groundfish vessels, as well as on some open-access groundfish vessels. Currently the program samples approximately 20% of limited entry trawl trips and has been expanding coverage of the limited entry fixed-gear and open access sectors.

Estimates derived from the WCGOP reports are used to calibrate incidental catch and discard rates in the bycatch models constructed and maintained by the PFMC Groundfish Management Team (GMT). The first and most developed bycatch model is used for managing of the limited entry trawl fishery. Preliminary bycatch models for the limited entry fixed gear and directed open access fleets have recently been developed.

The trawl bycatch model projects future landings of major trawl target species (excluding Pacific whiting) through use of recent landings data and an array of bimonthly trip limits. Landings projections are then used to estimate total mortality for target species and non-target species of concern through the application of average bycatch ratios. The principal data inputs to the trawl bycatch model are (1) fish tickets (landings), (2) WCGOP bycatch and discard rates, and (3) trawl logbooks (depth association of catch). Logbook data are used to partition observed landings into appropriate depth strata, by summarizing the depth distributions recorded in logbooks for each modeled target species. Bycatch ratios are generally stratified by target fishery; bimonthly period; latitude zone (north of 40°10' N. lat., between 40°10' and 38° N. lat., and south of 38° N. lat.); and depth zone (shoreward of Rockfish Conservation Areas (RCAs), and seaward of RCAs).

3.2.2 Whiting Commercial Fishery Data

The shoreside whiting sector is required to bring 100% of their catch to port for sampling. Landings, logbook data, and state port sampling data for the shoreside whiting sector are reported to PacFIN. (For information on this program see http://hmsc.oregonstate.edu/odfw/reports/hake.html). The at-sea whiting fishery has 100% on-board observer coverage. Total catch by vessels involved in the at-sea whiting fishery is summarized and maintained by NorPac. Since total catch in both the at-sea and shoreside whiting sectors is observed, either by at-sea observers or upon landing, bycatch models are not maintained for these sectors.

3.2.3 Recreational Catch Data

RecFIN (Recreational Fishery Information Network) maintains official estimates of West coast recreational fishery catch. Total annual catch estimates by state, species and fishing mode go back to 1980. The NOAA sponsored Marine Recreational Fishery Statistics Survey (MRFSS) was a major component of this data collection, but these data were also augmented with data collected from state funded sampling programs.

In 2003, it was determined that the States of Oregon and Washington would take over the entire recreational data collection program with funds from MRFSS diverted to sampling programs run by the individual states. This regime shift took place in mid-2003. At the beginning of 2004 in California a new expanded California Recreational Fisheries Survey (CRFS) replaced MRFSS. In Oregon and Washington the existing Ocean Boat Survey program was expanded, while in California the new CRFS is a partnership between PSMFC and CDFG. The new program in California provides much more precise estimates of recreational catch.

Data from these sources are still compiled into the RecFIN database. The new state-based programs allow monthly estimates of total catch and are timelier for in-season management. (See http://www.psmfc.org/recfin/index.html).

3.2.4 Economic Data

3.2.4.1 Ex-vessel Prices

The PacFIN system records deliveries by catcher vessels to shore-based buyers, and includes revenue information by species group for each landing. This data can be used to calculate average ex-vessel prices by species, port, area of catch and month. NorPac data records only delivery tonnage for the at-sea whiting sector. Delivery prices for the at-sea sector therefore must be inferred or imputed based on other information, e.g., shoreside prices.

3.2.4.2 Ex-processor Prices

Unfortunately there is no systematic collection of ex-processor prices for seafood products produced on the West Coast. NOAA Fisheries has periodically surveyed processors to collect production and wholesale price information, but these data have not been considered highly useful (Freese, 2006). Other estimates of these values have been included in the Fisheries Economic Assessment Model (FEAM), which is used by the Council to estimate income impacts attributable to West Coast commercial fisheries. However, ex-processor prices in the FEAM tend to be fairly aggregated, and are not differentiated by month or product form (i.e., frozen vs. fresh). Any detailed information on West

Coast ex-processor prices must be collected through a survey or key informant interviews, or inferred from examination of other sources. The absence of processed product and wholesale price information may limit the types of analysis that can be conducted.

3.2.4.3 Vessel Costs

There are no current, comprehensive estimates of costs for West Coast commercial harvester vessels available. However NWFSC is currently conducting a cost and earnings survey of West Coast trawl vessels. It is assumed that results will be available in time for inclusion in the EIS. FEAM does include average cost estimates for several representative vessel types. However estimates used in the most current version of the FEAM are several years old and predate the recent run-up in fuel prices.

3.2.4.4 Processor Costs

There are no current, comprehensive estimates of costs for West Coast processors available. FEAM does include average cost estimates for several representative types of processors. However, estimates used in the most current version of the model are several years old and predate the recent run-up in fuel prices. Any detailed information on West Coast processor costs must be collected through a survey or key informant interviews, or inferred from examination of other sources.

3.3 List of Potentially Affected Resource and Stakeholder Groups

The Consulting Team is proposing to develop profiles of the following resource and stakeholder groups. The amount of detail in any of the profile will depend on the level of interaction with the groundfish trawl fishery. For example profiles of trawl catcher vessels will be extensive, while profiles of recreational harvesters will be highly aggregated. The Consulting Team does not consider this list final—some groups may be deleted and/or new ones added.

- Limited-entry Trawl Groundfish Catcher Vessels
- Trawl Catcher Processors
- Processors and Buyers of Trawl Groundfish
- Other Non-Trawl Commercial Harvesters
- Processors and Buyers that do Not Purchase Trawl Groundfish
- Recreational Harvesters[8]
- Communities
- Tribes
- Input Suppliers
- Wholesalers and Retailers of Groundfish
- Consumers
- General Public
- Management Agencies
- Groundfish Resources

[8] Recreational harvesters will be profiled in a very general way showing total catch and relative dependence on groundfish.

- Other Fish Resources
- Marine Mammals
- Other Protected Resources
- Seabirds
- Habitat
- Trophic Relationships[9]

3.4 Limited-entry Trawl Groundfish Catcher Vessels

The description of limited-entry trawl groundfish catcher vessels contains the following sub-sections:

- Sub-section 3.4.1describes the classification of potentially affected trawl catcher vessels and permit holders.
- Sub-section 3.4.2 lists the condition indicators used to describe the historical and current status of trawl catcher vessels and permit holders.
- Sub-section 3.4.3 summarizes participation of all trawl catcher vessel classes.

3.4.1 Classification of Potentially Affected Trawl Catcher Vessels

This section discusses the directly affected fish harvester component of the affected environment. The preliminary specification of six trawl catcher vessel classes is shown in Table 3-1, together with an initial description of each class.

Table 3-1. Preliminary Specification of Trawl Catcher Vessel Classes

Vessel Class	Description
Offshore Whiting Trawl CV (OW-TCV)	Whiting deliveries to motherships account for 50 percent or more of West Coast revenue. Whiting deliveries to onshore processors are minimal.
Inshore Whiting Trawl CV (IW-TCV)	Whiting deliveries to onshore processors is 50 percent or more of West Coast revenue. Whiting deliveries to motherships are minimal.
Combination Onshore-Offshore Whiting Trawl CV (CW-TCV)	Whiting deliveries account for 50 percent or more of West Coast revenue. Deliveries to both onshore and offshore processors.
Large Diversified Trawl CV (LD-TCV)	Larger diversified vessels; Whiting revenue is less than 50 percent of West Coast revenue. Fish year-round in both deepwater and near-shore fisheries.
Small Diversified Trawl CV (SD-TCV)	Smaller diversified vessels; Whiting revenue is less than 50 percent of West Coast revenue. Generally fish near shore and not during winter.
Bought-out Trawl CVs (BO-TCV)	This class contains the vessels that where bought out of the fishery in the industry funded buyback in 2003.

Determination of whether a permit and associated vessel(s) are classified into a particular class will be based on landings during the years 1994-2005. Each permit will be assigned to one and only one class regardless of operational changes the operation utilizing the permit may have made. Regardless of

[9] This analysis uses the term Trophic Relationships to specifically represent predator prey relationships. The term "ecosystems" is often used instead, but the Consulting Team believes that the term "ecosystem" comprises all of the resources and stakeholders already listed, and therefore listing it as a separate resource is redundant.

whether a permit might appear to belong to any class, if it was bought out in the 2003 industry funded buyback it will be classified as a Bought-Out Trawl CV.

The Consulting Team notes that feedback received during the Trawl IFQ Workshop held in Portland, OR, April 18-20, 2006, indicated that there may be other ways to classify the diversified trawl vessels. For example it might be that these vessels would be better classified in terms of geographic location—vessels operating out of California and Southern Oregon have a narrow shelf width compared to vessels operating out or Northern Oregon or Washington. The final classification scheme for trawl catcher vessels will be determined during the actual EIS analysis in Phase 2. At that time, a complete assessment of catches and catch patterns will be utilized for classification.

3.4.2 Condition Indicators for Trawl Catcher Vessels

Indicators of the historical and baseline conditions of trawl catcher vessels include but are not necessarily limited to the following:

- Catch by species
- Catch as by species as a percent of optimum yield
- Incidental catch by species by target fisheries
- Discarded catch by species and target fishery
- Distribution of catches by month
- Ex-vessel revenues from groundfish
- Distribution of catches among the trawl fleet and sectors
- Relative dependency on West Coast trawl groundfish
- Relationships with processors
- Operating costs
- Net revenues
- Number of participating trawl catcher vessels
- Number of permit holders
- Distribution of permit holders by community
- Number of trips per year
- Number of fishing days per year
- Number of crew members
- Distribution of crew members by community
- Crew and skipper shares

Some conditions may not be measurable by quantifiable indicators. These include vessel safety, market power vis-à-vis processors, and others.

3.4.3 Summary of Past and Present Conditions of Trawl Catcher Vessels

This section summarizes and compares participation over all trawl catcher vessel classes described in Table 3-1. Detailed descriptions of each vessel class are provided in Sections 3.4.3.4 – 3.4.4.6. This summary highlights the conditions and indicators that are the most important determinants of outcomes under the alternatives—total participation, landings and ex-vessel value by species, landings and ex-vessel value by target strategy, and incidental catches of overfished species by target strategy.

The section compares the situation in 2005 (baseline condition) and historical conditions during the 1994-2005 period.

3.4.3.1 Number of Active Permit Holders and Vessels

This section summarizes participation in terms of the number of limited trawl permits holders during the historical period and in 2005. The section shows the annual number of active number of permits by year and vessel class; the annual number of active number of permits by year and species; the total number of permits by species and catcher vessel class over the historical period, and the number of active permits by species and catcher vessel class in 2005.

A trawl IFQ program is likely to affect the number of active permits in the West Coast groundfish trawl fishery during the initial allocation of IFQs to permit holders and during the fleet consolidation that is likely to follow implementation of the program.

Table 3-2. Active Permits by Trawl CV Class, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Vessel Class	**Number of Active Permit Holders**												
Offshore Whiting TCV (OW-TCV)													
Inshore Whiting TCV (IW-TCV)													
Combo Whiting TCV (OW-TCV)													
Large Diversified TCV (LD-TCV)													
Small Diversified TCV (SD-TCV)													
Bought Out TCV (BO-TCV)													
All TCV													

Note: If more than one permit is assigned to a given vessel in a year only one active permit holder is counted.

Table 3-3. Active Permits from all Trawl CV Classes by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	Number of Active Permit Holders												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-4. Active Permits by Trawl CV Class and Species, 1994-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species	**Number of Active Permit Holders**						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

Table 3-5. Active Permits by Trawl CV Class and Species, 2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species	**Number of Active Permit Holders**						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

3.4.3.2 Total Landings and Ex-vessel Value

This section summarizes landings and ex-vessel values generated by limited trawl permits holders during the historical period (1994-2005) and in 2005.

A trawl IFQ program is likely to affect the amount and distribution of landings and ex-vessel values across vessel classes. For example, the initial allocation of IFQs will likely be based to some extent on historical landings. To the extent that historical landings patterns match landings patterns in 2005, distributional changes in the fishery caused by the initial allocation will be minimized. Showing the changes in landing patterns over time by vessel class provides insights into the potential effects of the initial allocation and the consolidation of the fleet that is likely to follow. Additional details on landings and ex-vessel values within vessel classes are shown in Sections 3.4.3.4 – 3.4.4.6.

Table 3-6. Total Landings by Trawl CV Class, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Vessel Class	**Total Landings (MT)**												
Offshore Whiting TCV (OW-TCV)													
Inshore Whiting TCV (IW-TCV)													
Combo Whiting TCV (OW-TCV)													
Large Diversified TCV (LD-TCV)													
Small Diversified TCV (SD-TCV)													
Bought Out TCV (BO-TCV)													
All TCV													

Table 3-7. Total Ex-Vessel Value by Trawl CV Class, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Vessel Class	**Total Ex-Vessel Value ($1,000 in 2005$)**												
Offshore Whiting TCV (OW-TCV)													
Inshore Whiting TCV (IW-TCV)													
Combo Whiting TCV (OW-TCV)													
Large Diversified TCV (LD-TCV)													
Small Diversified TCV (SD-TCV)													
Bought Out TCV (BO-TCV)													
All TCV													

Table 3-8. Landings from all Trawl CV Classes by Species and Year, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	Total Landings (MT)												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-9. Total Landings as a Percent of Optimum Yield by Species and Year, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Total Landings as a Percent of Optimum Yield**												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-10. Ex-Vessel Value for all Trawl CV Classes by Species and Year, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	Total Ex-Vessel Value ($1,000 in 2005$)												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-11. Total Landings by Trawl CV Class and Species, 1994-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species	Total Landings (MT)						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

Table 3-12. Landings by Trawl CV Class as a Percent of Total Landings, 1994-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species	**Percent of Total Landings**						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

Table 3-13. Landings by Trawl CV Class as a Percent of Total Landings, 2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species				**Percent of Total Landings**			
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

Table 3-14. Ex-vessel Value by Trawl CV Class and Species, 1994-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species	Ex-Vessel Value ($1,000 in 2005$)						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

Table 3-15. Ex-vessel Value by Trawl CV Class as a Percent of Total Ex-Vessel Value, 1994-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species	**Percent of Total Ex-vessel Value**						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

Table 3-16. Ex-vessel Value by CV Class as a Percent of Total Ex-Vessel Value, 2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	Total
Species	**Percent of Total Ex-vessel Value**						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							

3.4.3.3 Ex-Vessel Value, Landings and Incidental Catch Rates by Target Strategy

This section summarizes fishing of the limited entry trawl fleet by target strategy during the historical period (1994-2005) and in 2005. Target strategies are based on landings by species in individual fish-tickets for shore-based landings. The target strategy for deliveries to motherships is assumed to be Pacific whiting.

Target strategies vary significantly by vessel class—by definition, the three whiting vessel class target Pacific whiting more than any other target, while the diversified vessel classes utilize other strategies more than whiting. Target strategies are important under a trawl IFQ program because incidental catches of overfished species vary by target strategy. For example, if a target strategy has low incidental catch rates of a particular overfished species, vessel classes that utilize that target strategy will have a lower need for IFQs for that species.

This section also provides a summary of incidental catch rates for all limited entry trawl vessels by target strategy from 2001-2005. These tables are derived using a process similar to that used in the NOAA Fisheries Bycatch Model.

Table 3-17. Ex-Vessel Value by Target Strategy and Vessel Class, 1994-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target	Ex-Vessel Value ($1,000 in 2005$)						
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-18. Ex-Vessel Value by Target Strategy and Vessel Class, 2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target	Ex-Vessel Value ($1,000 in 2005$)						
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-19. Target Strategy as a Percent of Ex-Vessel Value by Vessel Class, 1994-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target	Percent of Ex-Vessel Value						
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-20. Target Strategy by Vessel Class as a Percent of Ex-Vessel Value, 2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target	Percent of Ex-Vessel Value						
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-21. Estimated Catches of Target Species by Target Strategy and Vessel Class, 2001-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target	Catches (MT)						
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-22. Estimated Catches of Target Species by Vessel Class as a Percent of All Classes, 2001-2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target	Percent of All Classes						
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-23. Estimated Catches of Target Species by Target Strategy and Vessel Class, 2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target				**Catches (MT)**			
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-24. Estimated Catches of Target Species by Vessel Class as a Percent of All Classes, 2005

Vessel Class	OW-TCV	IW-TCV	CW-TCV	LD-TCV	SD-TCV	BO-TCV	All Classes
Target				**Percent of All Classes**			
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

Table 3-25. Estimated Incidental Catch Rates of Overfished Species by Target Strategy, 2001-2005

Overfished Species	Bocaccio	Cowcod	Canary Rockfish	Dark-blotched rockfish	Pacific Ocean Perch	Widow Rockfish	Yelloweye Rockfish
Target				**Percent of Target Species Catch**			
Pacific Whiting							
DTS Complex							
Petrale Sole							
Slope Rockfish							
Other Rockfish							
Arrowtooth Flounder							
Other Flatfish							
Other Targets							
All Targets							

3.4.3.4 Distribution of Landings by Species and Month

This section summarizes the distribution of landings of trawl catcher vessels by month. This is an important indicator because under an IFQ program vessels will likely want to change their fishing period to optimize catches of target species relative to catches of overfished species. Section 3.6.3.3 in provides a summary of ex-vessel prices paid by month.

Table 3-26. Trawl Groundfish Landings as a Percent of Volume by Species and Month, 1994-2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Species	Percent of Total Volume											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-27. Trawl Groundfish Landings as a Percent of Volume by Species and Month, 2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Species	**Percent of Total Volume**											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-28. Trawl Groundfish Landings as a Percent of Volume by Trawl CV Class and Month, 1994-2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vessel Class	Percent of Total Volume											
OW-TCV												
IW-TCV												
CW-TCV												
LD-TCV												
SD-TCV												
BO-TCV												
All TCVs												

Table 3-29. Trawl Groundfish Landings as a Percent of Volume by Trawl CV Class and Month, 2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vessel Class	Percent of Total Volume											
OW-TCV												
IW-TCV												
CW-TCV												
LD-TCV												
SD-TCV												
BO-TCV												
All TCVs												

Table 3-30. Trawl Groundfish Landings as a Percent of Value by Trawl CV Class and Month, 1994-2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vessel Class	Percent of Total Value											
OW-TCV												
IW-TCV												
CW-TCV												
LD-TCV												
SD-TCV												
BO-TCV												
All TCVs												

Table 3-31. Trawl Groundfish Landings as a Percent of Value by Trawl CV Class and Month, 2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Vessel Class	Percent of Total Value											
OW-TCV												
IW-TCV												
CW-TCV												
LD-TCV												
SD-TCV												
BO-TCV												
All TCVs												

3.4.4 Past and Present Conditions of Trawl Catcher Vessel Classes

3.4.4.1 Offshore Whiting Trawl Catcher Vessels

The Offshore Whiting Trawl Catcher Vessel class (OW-TCV) includes permits and the vessel associated with those permits that have been primarily engaged in the offshore whiting fishery over the years from 1994 – 2005. Vessels that are defined as being in this class will have generated more than 50 percent of their West Coast groundfish revenue in deliveries of whiting to motherships during the period. The offshore whiting fishery is distinct from the Inshore Whiting Fishery in that deliveries are made to motherships by transferring trawl cod-ends at the end of each tow. Because these vessels deliver directly to motherships they do not necessarily need a RSW hold, and may stay out at sea for longer periods than Inshore Whiting Trawl CVs.

3.4.4.1.1 Class Characteristics and Participation

This section describes class behavior and participation, as well as vessel size and design. To shorten this outline document, only table and figure captions and headings are shown.

Table 3-32. Number of Offshore Whiting Trawl Catcher Vessels by Length, 1994-2005

	Vessel Lengths Associated with Permits Assigned to the Class					
Year	60-79’	80’-94’	95’-109’	110’-124’	124’+	Total

The numbers of active vessels in this class by year are graphically depicted in Figure 3-1.

Figure 3-1. Number of Offshore Whiting Catcher Vessels, 1994-2005

Figure 3-2 shows the number of years a permit was active during the historical period. Under a trawl IFQ program, the number of years a permit was active will directly correlate with the amount of IFQs received relative to average catches in active years. For example, if a permit was active for 6 of the 12 years in the quota share historical period, it is likely that the amount of IFQs for a species allocated to the permit will yield IFQs approximately equal to 50 percent of the permit’s average landings during active years, assuming total catch for the species was relatively constant over the historical period.

Figure 3-2. Histogram of Duration of Participation, Offshore Whiting Trawl Catcher Vessels, 1994-2005

3.4.4.1.2 Description of Fishing Operations

This section provides a general background on these vessels, including their history of participation in the West Coast groundfish trawl fishery and other fisheries. While this vessel class by definition is specialized in the whiting fishery, it is possible that vessels in this class have participated in other fisheries during the 1994-2005 period.

3.4.4.1.3 Dependence on West Coast Groundfish Trawl Fishery and Annual Cycle of Operations

Figure 3-3 and Table 3-33 show the relative dependence on limited entry trawl groundfish relative to other West Coast and Alaska fisheries.

Figure 3-3. Ex-Vessel Value of Harvest by Offshore Whiting CVs by Fishery, 1994-2004

Table 3-33. Number of Offshore Whiting Catcher Vessels Participating by Fishery, 1994-2004

	Number of Vessels						
Year	Limited Entry Trawl Groundfish	Limited Entry Fixed Gear Groundfish	Open Access Groundfish	Dungeness Crab	Other West Coast	Alaska	Total

Table 3-34. Ex-Vessel Value of Non-Groundfish Species Harvested by Offshore Whiting Catcher Vessels by Species, 1994-2004

	Number of Vessels						
Year	Limited Entry Trawl Groundfish	Limited Entry Fixed Gear Groundfish	Open Access Groundfish	Dungeness Crab	Other West Coast	Alaska	Total

Table 3-35 shows ex-vessel value by month in 2003 and 2004, while Table 3-36 shows vessel participation. With IFQs there may be opportunities for these vessels to change their annual round.

Table 3-35. Ex-Vessel Value of Species Harvested by Offshore Whiting Trawl CVs by Season, 2003-2004

Year	Fishery	Ex-Vessel Value ($ Millions)						
		Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Total
2003	Limited Entry Trawl							
	Limited Entry Fixed Gear							
	Open Access							
	Dungeness Crab							
	Other West Coast							
	Alaska Fisheries							
	Total							
2004	Limited Entry Trawl							
	Limited Entry Fixed Gear							
	Open Access							
	Dungeness Crab							
	Other West Coast							
	Alaska Fisheries							
	Total							

Source:

Table 3-36. Number of Active Vessels by Fishery and Season, 2003-2004

Year	Fishery	Number of Active Permits						
		Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Total
2003	Limited Entry Trawl							
	Limited Entry Fixed Gear							
	Open Access							
	Dungeness Crab							
	Other West Coast							
	Alaska Fisheries							
	Total							
2004	Limited Entry Trawl							
	Limited Entry Fixed Gear							
	Open Access							
	Dungeness Crab							
	Other West Coast							
	Alaska Fisheries							
	Total							

Source:

3.4.4.1.4 Catch Quantity and Value in West Coast Groundfish Trawl Fishery

This section discusses the harvest amount and value of the Offshore Whiting Trawl CV class in the West Coast groundfish trawl fishery. The following types of information are presented:

- Participation levels by groundfish species
- Participation levels by target strategy
- Incidental catch by target strategy
- Ex-vessel value of deliveries by processor class

Table 3-37 through Table 3-39 show the number of permits, landed tons, and ex-vessel value by species in the Offshore Whiting Trawl CV class from 1994-2005.

Table 3-37. Active Permits in the Offshore Whiting Trawls CV Class by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	Number of Active Permits												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-38. Landings of Offshore Whiting Trawl CV by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Metric Tons**												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-39. Ex-Vessel Value of Offshore Whiting Trawl CV by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Ex-Vessel Value ($ Millions in 2005$)**												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Figure 3-4 shows a hypothetical distribution of catch of species X among vessels in the class from 1994-2005 and in 2005. Similar figures will be generated for each groundfish species landed in the limited entry trawl fisheries. The total over all years is shown because it represents the historical distribution of landings among vessels in the class, while the distribution in 2005 is shown because it represents participation in the baseline year.

Figure 3-4. Distribution of Landings of Species X by the Offshore Whiting Trawl CV Class

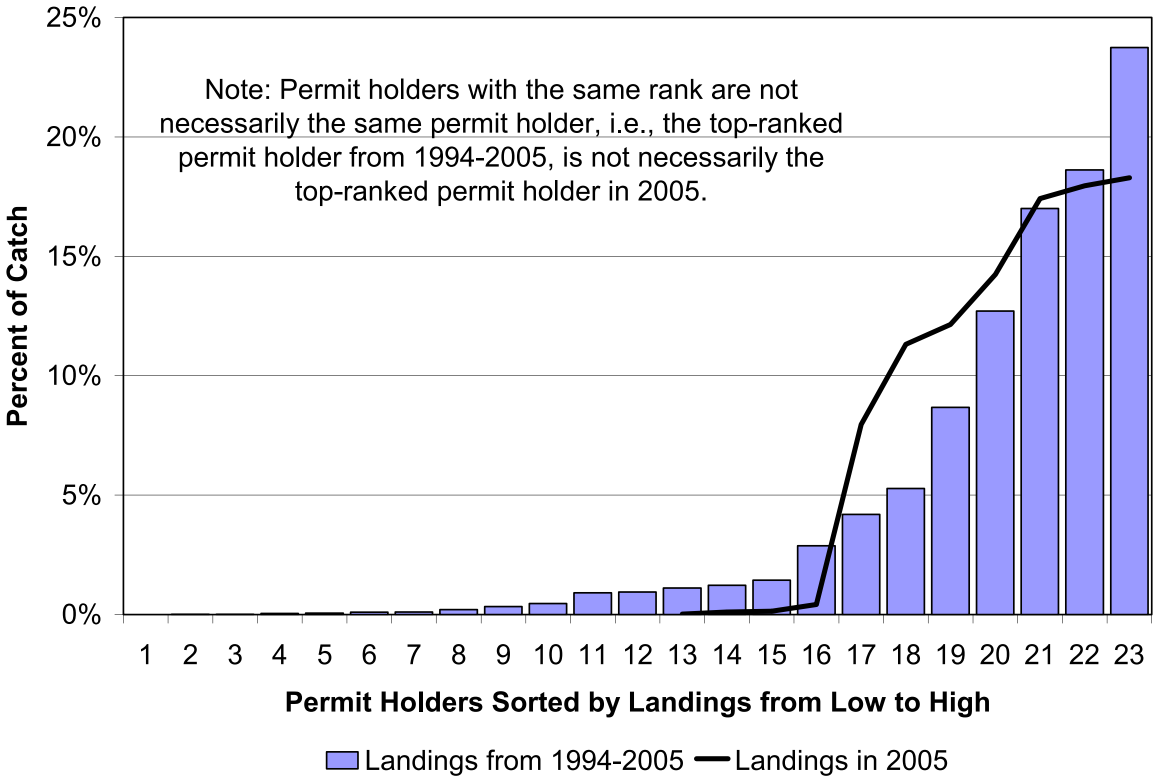


Table 3-40 through Table 3-42 present information on participation by target strategy for the Offshore Whiting Trawl CV class from 1994–2005. Target strategies can provide insights into the participation of the Offshore Whiting Trawl CV in seasonal fisheries, as well as insights into potential opportunities for expansion by the class. In addition, examining participation by target strategy may provide the only means to accurately estimate incidental catch. This is because catch of a particular species can only be considered incidental if it is not intentionally caught but rather taken while targeting other species. It should of course be noted that targeting strategies in three whiting vessel classes are largely pre-determined—i.e., whiting and little else. To the extent they exist, the analysis will document other targeting strategies that have been utilized by vessels in this class over the years.

Defining a target strategy for a particular trip is difficult. The Consulting Team intends to use the algorithms developed by NMFS for the Trawl Bycatch Model to identify a particular strategy for each trip recorded in the fish ticket database.

Table 3-40. Number of Permits for the Offshore Whiting Trawl CV Class by Target Strategy, 1994-2005

Year	Pacific Whiting	DTS Complex:	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets	Total
	Number of Active Permits in each Target Strategy								

Table 3-41. Total Landings of Offshore Whiting Trawl CVs by Target Strategy, 1994-2005

Year	Pacific Whiting	DTS Complex:	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets	Total
	Total Landings of Target Species (MT)								

Table 3-42. Ex-Vessel Value of Offshore Whiting Trawl CVs by Target Strategy, 1994-2005

Year	Pacific Whiting	DTS Complex:	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets	Total
	Ex-Vessel Value ($1,000 in 2005$)								

Additional information on the targeting strategies of this class is provided in Table 3-43 through Table 3-46.[10] These tables show the intensity of fishing activity during the year. The average number of trips per year and the average length of trip are expected to be affected under a trawl IFQ program. Catch per day is also likely to be an important measure of effectiveness. Additional tables may also be developed to show capacity levels and capacity utilization by target strategy in order to identify potential opportunities for fleet consolidation. Each table will show data for 2000 through 2005 and will show both annual and two-month period data.

Table 3-43. Average Trips per Vessel of Offshore Whiting Trawl CVs by Target Strategy, 2000-2005

2-Month Period	Pacific Whiting	DTS Complex	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets
	Number of Trips							
Jan-Feb 2000								
Mar-Apr 2000								

Table 3-44. Average Days per Trip by Offshore Whiting Trawl CVs by Target Strategy, 2000-2005

2-month period	Pacific Whiting	DTS Complex	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets
	Average Days Per Trip							
Jan-Feb 2000								
Mar-Apr 2000								

[10] In general, vessels in the offshore whiting CV class do not participate in many other target fisheries on the West Coast. However, it is believed that some vessels that are classified as this type of vessel do participate in other West Coast groundfish fisheries. To the extent they do, their efforts will be described here.

Table 3-45. Catch per Day by Offshore Whiting Trawl CVs by Target Strategy and period, 2000-2005

	Pacific Whiting	DTS Complex	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets
2-Month Period	Catch per Day (MT)							
Jan-Feb 2000								
Mar-Apr 2000								

Table 3-46. Ex-Vessel Value per Day by Offshore Whiting Trawl CVs by Target Strategy and period, 2000-2005

	Pacific Whiting	DTS Complex	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets
2-Month Period	Ex-Vessel Value per Day							
Jan-Feb 2000								
Mar-Apr 2000								

3.4.4.1.5 Incidental Catch of Offshore Whiting Trawl CVs in Target Fisheries

One of the primary objectives of a trawl IFQ program is the reduction of incidental catch. By developing tables showing rates of incidental catch under various target strategies, it may be possible to project how effective a trawl IFQ program will be in reducing incidental catch. The Consulting Team believes that incidental catch rates by vessel class can be estimated using observer data over a period of several years. Table 3-47 shows the estimated average incidental catch rate over 2001-2005 for Offshore Whiting Trawl CVs by target strategy. Incidental catch rates are equal to the catch of incidental species as a percent of the total catch of target species. In the case of the DTS complex and Slope Rockfish, the denominator is the total catch of all species in the complex.

Table 3-47. Average Incidental Catch by Target Strategy, 2001-2005

	Pacific Whiting	DTS Complex	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets
Incidental Catch Species	**Incidental Catch of Species (Row) as a percent of Total Catch of Target Species**							
Arrowtooth Flounder								
Bank Rockfish								
Black Rockfish OR-CA								
Black Rockfish WA								
Blackgill Rockfish								
Bocaccio Rockfish								
Canary Rockfish								
Chili/Eureka Rockfish								
Chilipepper Rockfish								
Cowcod								
Darkblotched Rockfish								
Dover Sole								
English Sole								
Lingcod								
Minor Rockfish (N)								
Other Flatfish								
Other Rockfish (N)								
Other Rockfish (S)								
Other Species								
Pacific Cod								
Pacific Ocean Perch								
Pacific Whiting								
Petrale Sole								
Redstripe Rockfish								
Sablefish								
Thornyhead (Lg.)								
Thornyhead (Sh.)								
Sharpchin Rockfish								
Shortbelly Rockfish								
Silvergrey Rockfish								
Splitnose Rockfish								
Widow Rockfish								
Yelloweye Rockfish								
Yellowmouth Rockfish								
Yellowtail Rockfish								

Table 3-48 shows estimated total catch by target species for the period 2001-2005 by two-month trip limit period. These data represent the denominator in estimates of incidental catch rates for all species in each target strategy shown in Table 3-49. Table 3-49 shows average incidental catch rates by period over the year 2001-2005 for Offshore Whiting Trawl CVs. Additional tables will be developed for the other target strategies. The Consulting Team believes that if the incidental catch rate for a target species is relatively high during a particular period, it is likely that under an IFQ program catcher vessels will try to shift effort to periods with lower rates. If incidental catch rates do not vary by period, there will be less impetus for temporal shifts.

Table 3-48. Estimated Total Catch of Target Species by Season in Each Target Fishery by Period, 2001-2005

	Pacific Whiting	DTS Complex:	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets	Total
Period	Estimated Total Catch (metric tons)								
Jan-Feb									
Mar-Apr									
May-Jun									
Jul-Aug									
Sep-Oct									
Nov-Dec									

Table 3-49. Average Incidental Catch Rates by Target Strategy and Period, 2001-2005

Target	Pacific Whiting						DTS Complex:						Petrale Sole						Slope Rockfish					
Period	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Incidental Species	Incidental Catch of Species as a Percent of Total Catch of Target Species																							
Arrowtooth Flounder																								
Bank Rockfish																								
Black Rockfish OR-CA																								
Black Rockfish WA																								
Blackgill Rockfish																								
Bocaccio Rockfish																								
Canary Rockfish																								
Chili/Eureka Rockfish																								
Chilipepper Rockfish																								
Cowcod																								
Darkblotched Rockfish																								
Dover Sole																								
English Sole																								
Lingcod																								
Minor Rockfish (N)																								
Other Flatfish																								
Other Rockfish (N)																								
Other Rockfish (S)																								
Other Species																								
Pacific Cod																								
Pacific Ocean Perch																								
Pacific Whiting																								
Petrale Sole																								
Redstripe Rockfish																								
Sablefish																								
Thornyhead (Lg.)																								
Thornyhead (Sh.)																								
Sharpchin Rockfish																								
Shortbelly Rockfish																								
Silvergrey Rockfish																								
Splitnose Rockfish																								
Widow Rockfish																								
Yelloweye Rockfish																								
Yellowmouth Rockfish																								
Yellowtail Rockfish																								

Incidental catch rates are also likely to vary by geographic region. If particular areas generally exhibit comparatively lower incidental catch rates, it is likely that under a trawl IFQ program additional effort will be directed to areas with lower rates. Table 3-50 shows estimated total catches of target species by management area from 2001-2005. These data represent the denominator in estimates of incidental catch rates for all species in each target strategy as shown in Table 3-51.

Table 3-50. Estimated Total Catch of Target Species by Management Area, 2001-2005

	Pacific Whiting	DTS Complex:	Petrale Sole	Slope Rockfish	Other Rockfish	Arrowtooth Flounder	Other Flatfish	Other Targets	Total
Area	**Estimated Total Catch (metric tons)**								
Vancouver									
Columbia									
Eureka									
Monterey									
Conception									

Table 3-51. Average Incidental Catch Rates by Management Area, 2001-2005

Target	Pacific Whiting		DTS Complex:		Petrale Sole		Slope Rockfish	
Area	Vanc. Col.	Eur. Mont.	Vanc. Col.	Eur. Mont.	Vanc. Col.	Eur. Mont.	Vanc. Col.	Eur. Mont.
Incidental Species	Incidental Catch of Species (Row) as a percent of Total Catch of Target Species							
Arrowtooth Flounder								
Bank Rockfish								
Black Rockfish OR-CA								
Black Rockfish WA								
Blackgill Rockfish								
Bocaccio Rockfish								
Canary Rockfish								
Chili/Eureka Rockfish								
Chilipepper Rockfish								
Cowcod								
Darkblotched Rockfish								
Dover Sole								
English Sole								
Lingcod								
Minor Rockfish (N)								
Other Flatfish								
Other Rockfish (N)								
Other Rockfish (S)								
Other Species								
Pacific Cod								
Pacific Ocean Perch								
Pacific Whiting								
Petrale Sole								
Redstripe Rockfish								
Sablefish								
Thornyhead (Lg.)								
Thornyhead (Sh.)								
Sharpchin Rockfish								
Shortbelly Rockfish								
Silvergrey Rockfish								
Splitnose Rockfish								
Widow Rockfish								
Yelloweye Rockfish								
Yellowmouth Rockfish								
Yellowtail Rockfish								

Table 3-52 and Table 3-53 show the number of vessels and ex-vessel value of the Offshore Whiting Trawl CV class by management area.

Table 3-52. Number of Offshore Whiting Trawl CVs by Management Area, 1994-2005

Year	Vancouver	Columbia	Eureka	Monterey	Conception	Total

Table 3-53. Ex-Vessel Value of Harvest by Offshore Whiting Trawl CVs by Management Area, 1994-2005

Year	Vancouver	Columbia	Eureka	Monterey	Conception	Total

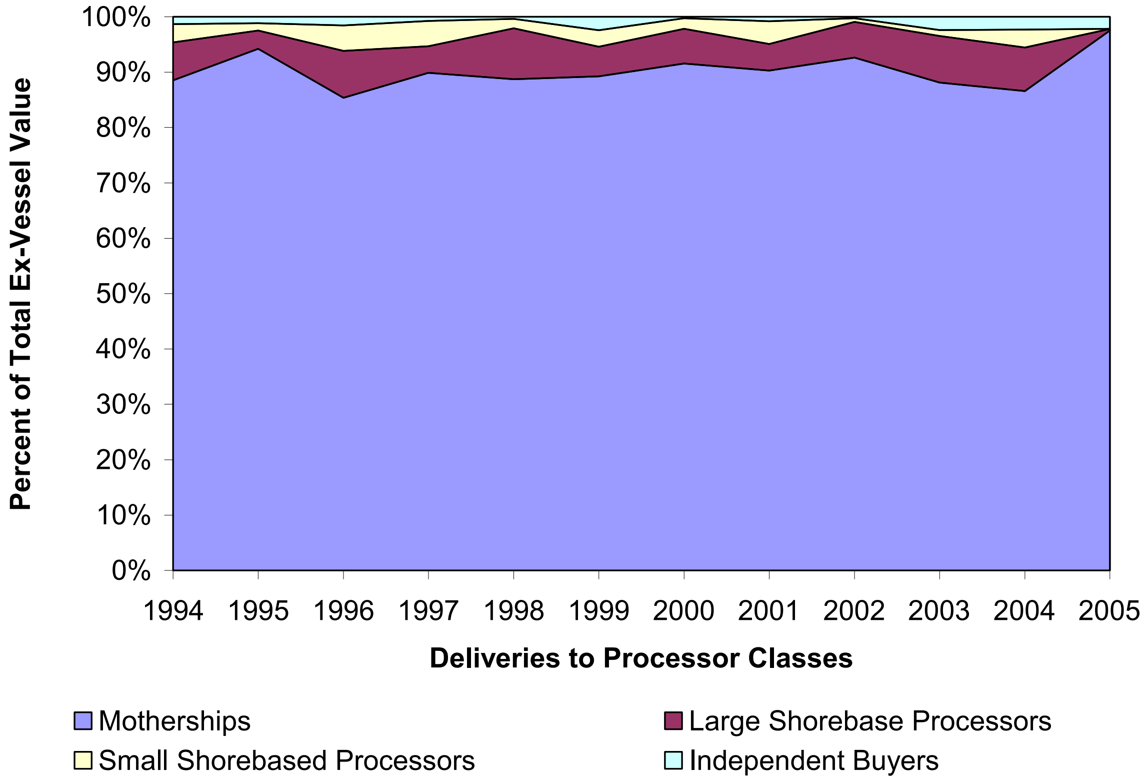
The following figures provide additional information on the geographic distribution of average annual catches of primary target species for Offshore Whiting Trawl CVs. These figures will be derived from log book data.

Figure 3-5. Average Annual Whiting Catch by Offshore Whiting CVs by Lat/Long, 1997-1998

3.4.4.1.6 Relationships with Processors

The Consulting Team believes that a trawl IFQ program could change not only the spatial and temporal distribution of catches, but also the distribution of landings of Offshore Whiting Trawl CVs across processing classes as catcher vessels and processors respond to new opportunities. While this may not be a likely outcome for Offshore Whiting Trawl CVs, some other trawl CV classes are likely to experience changes in the distribution of landings. Figure 3-6 (shown here with hypothetical data) shows the reliance of Offshore Whiting Trawl CVs on various processors of trawl groundfish from 1994 through 2005.

Figure 3-6. Ex-Vessel Value Paid to Offshore Whiting Trawl CVs by Processor Class, 1994-2005 (Hypothetical Data)



Source: Data in figure are hypothetical.

A trawl IFQ program is likely to alter the relationship between harvesters and processors/buyers. One way to measure the stability of these relationships is to examine the number of different processing companies to which catcher vessels deliver their fish. Table 3-54 examines the stability of the relationship between harvesters and processors by year.

Table 3-54. Number of Processors to which Offshore Whiting TCV Deliver, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Number of Processors	Vessels Delivering to Different Processors by Count of Companies											
1												
2												
3												
4												
5+												
Number of Processors	Ex-Vessel Value ($ Millions in 2005$) Delivered to Processors by Count of Companies											
1												
2												
3												
4												
5+												
Number of Processors	Percent Ex-Vessel Value Delivered to Processors by Count of Companies											
1												
2												
3												
4												
5+												

3.4.4.1.7 Safety

This section discusses maydays, deaths, and sinking's reported from 1994-2004 for Offshore Whiting Trawl CVs. These data are available from the US Coast Guard. The impetus to fish in poor weather may be reduced under a trawl IFQ program, thereby reducing the number of incident calls received by the US Coast Guard.

3.4.4.1.8 Cost and Net Revenue Estimates

This section describes the costs and net revenues of the Offshore Whiting Trawl CV class. Estimates of fixed and variable costs from an ongoing survey of permit holders may be available for use in the analysis of a trawl IFQ program.

Cost estimates will be aggregated/divided into several categories that are likely to be affected by a transition to a trawl IFQ program, including:

- Share of gross revenue paid to crew and skipper
- Crew size
- Fuel costs per day
- Other trip costs per day
- Crew and liability insurance
- Vessel insurance
- Moorage
- Vessel and engine maintenance
- Administrative wages and salaries

- Other annual and fixed cost

Given that the survey of permit holders is currently ongoing, the Consulting Team assumes cost information would be based on estimates from either 2004 or 2005. In order to apply these estimates to historical catch and effort, they could be adjusted for inflation using standard producer price indexes. Fuel costs would be adjusted separately because they have changed more than other costs.

Historical trip, crew, and fixed costs as well as estimates of annual net revenues to permit holders and owners could be calculated by combining inflation adjusted cost estimates with historical trip data based on targeting strategy as described in Table 3-43 and Table 3-44.

3.4.4.1.9 Crew Employment and Income

The average vessel in the Offshore Whiting CV class typically carries a crew of X including the skipper.[11] Table 3-55 shows the estimated total number of crew (including skipper and administrative staff) in this class from 1994 through 2004.

Table 3-55. Number of Crewmembers and Crewmember Months in West Coast Groundfish Trawl Fishery by Offshore Whiting CVs, 1994-2004

Year	Number of Crew Members	Crewmember Months						Total
		Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	

Note: Employees will be credited to 1 FTE if the vessels takes 4+ trips per month, 0.75 at 3 trips per month, 0.5 FTE at two trips per month, etc.

Crewmembers typically are paid a share of the gross revenue. A share may be calculated as a portion of gross revenue such as gross revenue less food and fuel expenditures or gross revenue less food, fuel, and landing tax expenditures. Individual crew shares are about 6 to 10 percent of the gross revenue after expenditures have been subtracted. This analysis assumes that 40 percent of ex-vessel revenue goes to payments for labor. This share may shift dramatically if a trawl IFQ program rapidly reduces the number of catcher vessels operating in a region. Table 3-56 presents estimated payments to labor in groundfish and non-groundfish fisheries over time.

Table 3-56. Payments to Labor by Species Group by Offshore Whiting CVs in West Coast Groundfish Trawl Fishery by Period, 1994-2004

Year	$ Millions in 2005 $						
	Jan-Feb	Mar-Apr	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Total

Note: These will be estimated based on crew factors and crew share estimates from cost data gathered by NOAA Fisheries, or from key informant interviews.

3.4.4.1.10 Regional Residence of Permit Holders

Table 3-57 presents information on the residence of permit holders by region in the Offshore Whiting CV class. Table 3-58 and Table 3-59 show the ex-vessel revenue accruing to each region based on the assumption that a permit holder generally hires crewmembers who reside in the permit holder's region of residence. Table 3-60 shows the estimated crewmember months and payments to labor accruing to each region.

[11] Typical numbers of crewmembers on board will be determined using the NOAA cost survey or will be obtained from key informant interviews

Table 3-57. Number of Offshore Whiting Trawl CVs Landing Groundfish by Regional Residence of Permit Holder, 1994-2004

	Number of Vessels							
Region	N.WA	S.WA	N.OR	S.OR	N.CA	C.CA	S.CA	Total

Table 3-58. Ex-Vessel Revenue of Offshore Whiting Trawl CVs by Regional Residence of Permit Holder, 1994-2004

	$Millions							
Region	N.WA	S.WA	N.OR	S.OR	N.CA	C.CA	S.CA	Total

Table 3-59. Crewmember Months of Offshore Whiting Trawl CVs by Regional Residence of Permit Holder, 1994-2004

	Crewmember Months							
Region	N. WA	S. WA	N. OR	S. OR	N. A	C. CA	S. CA	Total

Table 3-60. Payments to Labor of Offshore Whiting Trawl CVs by Regional Residence of Permit Holder, 1994-2004

	$Millions							
Region	N. WA	S. WA	N. OR	S. OR	N. CA	C. CA	S. CA	Total

3.4.4.2 Shoreside Whiting Trawl Catcher Vessels

The Shoreside Whiting Trawl Catcher Vessel class (SW-TCV) consists of permit holders whose deliveries of whiting account for 50 percent or more of West Coast revenue. Whiting deliveries to motherships are minimal.

This section will contain a set of tables and figures similar to those provided for the Offshore Whiting Trawl CV class.

3.4.4.3 Combination Whiting Trawl Catcher Vessels

The Combination Whiting Trawl Catcher Vessel class (CW-TCV) consists of permit holders whose deliveries of whiting account for 50 percent or more of West Coast revenue. These vessels make significant deliveries to both onshore and offshore processors.

This section will contain a set of tables and figures similar to those provided for the Offshore Whiting Trawl CV class.

3.4.4.4 Large Diversified Trawl Catcher Vessels

The Large Diversified Trawl Catcher Vessel class (LD-TCV) consists of permit holders and associated vessels, whose revenue from Whiting is less than 50 percent of their West Coast revenue. These permit holders fish year-round in both deepwater and near-shore fisheries.

This section will contain a set of tables and figures similar to those provided for the Offshore Whiting Trawl CV class.

As noted in Section 3.4.1, the final classification of the diversified groundfish trawl vessels may change after the initial analysis of catch and participation data. Other possible classification criteria may include typical fishing patterns or geographic locations.

3.4.4.5 Small Diversified Trawl Catcher Vessels

The Small Diversified Trawl Catcher Vessel class (SD-TCV) consists of permit holders and associated vessels, whose revenue from Whiting is less than 50 percent of their West Coast revenue. These permit holders generally fish near shore and not during winter.

This section will contain a set of tables and figures similar to those provided for the Offshore Whiting Trawl CV class.

3.4.4.6 Bought-out Trawl Catcher Vessels

The Bought-Out Inshore Trawl Catcher Vessel class (BO-TCV) consists of permits holder and vessels that were bought out of the fishery in the industry-funded buyback in 2003. While these permit holders and vessels would not be directly affected by a trawl IFQ program—they are no longer in the West Coast groundfish trawl fishery and, therefore, ineligible to receive IFQs—the allocation formula of an IFQ program would distribute the catch of these vessels on an equal-share basis to permit holders that are eligible to receive IFQs. Therefore the catches of these permit holders are an important indicator of IFQ allocations. In addition, these permit holders and vessels delivered significant quantities of groundfish to various processor classes. After these vessels left the fishery in 2003, some buyers and processors had to seek out new suppliers of groundfish. By providing a summary of these vessels and their activities, the EIS is able to provide a more complete description of the West Coast groundfish trawl fishery.

This section will contain a set of tables and figures similar to those provided for the Offshore Whiting Trawl CV class.

3.5 Trawl Catcher Processors

3.5.1 Potentially Affected Trawl Catcher Processors

The trawl catcher processors that could be potentially affected participate primarily in the offshore whiting fishery and currently operate under the Pacific Whiting Conservation Cooperative.

3.5.2 Condition Indicators for Trawl Catcher Processors

Indicators of the historical and baseline conditions of trawl catcher processors include but are not necessarily limited to the following:

- Catch by species
- Incidental catch by species
- Discarded catch by species

- Distribution of catches by month
- Relative dependency on West Coast trawl groundfish
- Wholesale value of production
- Operating costs
- Net revenues
- Number of participating trawl catcher processors
- Number of trawl catcher processor permit holders
- Number of trips per year
- Number of fishing days per year
- Number of harvesting crew members
- Number of processing crew members
- Harvesting crew and skipper shares
- Product types and amounts by species
- Product recovery rates

Some conditions such as vessel safety may not be measurable by quantifiable indicators.

This section will contain a set of tables and figures similar to those provided for trawl catcher vessel classes. To the extent that information is available, additional tables will document processed product and wholesale value generated by trawl catcher processors.

3.6 Processors of Trawl-Caught Groundfish

Processors would be directly affected by a new management regime if the regime changes the way they currently operate or changes future opportunities. Processors that process groundfish caught with trawl gear would be directly affected by a trawl IFQ program, and could be allocated IFQs under options forwarded by the Council.

3.6.1 Classifications of Potentially Affected Processors

There are two major categories of processors of trawl groundfish—motherships and shore-based processors. In this analysis motherships are treated as a distinct class of processors, while shore-based processors are further subdivided based largely on the requirements of the options to allocate IFQs to processors. Many of the IFQ programs included in the main suite of alternatives would allocate IFQs to processors—companies that cut and package fish or handle live fish—but would not allocate IFQs to buyers that simply transfer unprocessed fish (unless it is live fish) to "processors". Therefore, the processor classification system must differentiate between buyers and processors. The issue is further complicated by the fact that "processors" are not specifically identified in PacFIN fish-tickets—the only reliable source of historical shore-based landings data for both harvesters and processors.[12]

For shorebased deliveries, PacFIN fish-tickets contain a field for the "processor," but this field is required to be completed by the "first receiver" of the fish from the catching vessel. In many cases the

[12] The problem of identification of processors does not apply to motherships because motherships are uniquely identified in the NORPAC At-Sea database.

receiver is not an entity that processes raw fish—some are agents of processors, while others are independent buyers. Furthermore, there does not appear to be a way to determine—short of first-hand knowledge—which receivers are processors, agents of processors, independent buyers that sell to multiple processors, or independent buyers that sell fish directly to the wholesale or retail market. Fortunately, some initial studies identify many of these linkages,[13] and members of the processing industry appear willing and able to assist in the classification process.

An additional difficulty arises from the consolidation that has occurred among processors and buyers in recent years. While it is well known, for example, that the Pacific Seafood Group has experienced considerable growth over the last 25 years,[14] other processors are also expanding through consolidation and acquisition—Bornstein Seafoods, for example, lists ten buying stations and processors on the West Coast on its Web site.[15] Because a relatively small number of firms own or control the majority of groundfish that are delivered to shore, treating individual processing facilities as independent entities would likely result in a misrepresentation of the impacts of a trawl IFQ program. The fact that there are few owners involved also creates data confidentiality issues.

Assuming that sufficient information regarding linkages between buyers and processors is available, the following definitions will be used to classify shore-based processors:

- Receivers of groundfish refer to entities that are listed in the fish-ticket data.
- Processors mean those entities that typically cut and package unprocessed fish for resale.[16] Processors may or may not be receivers of groundfish.
- Secondary Processors are those processors that cut and package fish that has already been processed.
- Buyers are entities that receive groundfish but do not process groundfish.
    - Associated buyers are those buyers that are linked by ownership, contract or employment to a processor or an entity that owns processors.
    - Independent buyers are those buyers that are not linked to a particular processor.

The Consulting Team is still investigating the most appropriate way to classify shore-based processors, but it tentatively proposes the following classification scheme:

1) Identify, to the extent feasible,[17] connections between receivers and primary processing facilities. If a receiver (or multiple receivers) and a particular processing facility (or multiple processing facilities) have a consistent link, they would be identified as a single "processing group". Each independent buyer would be identified as such. All other receivers would be associated with a processing group, either by themselves or with other buyers and processors. For example, all buyers and processors associated with the Pacific Seafood Group would be

[13] An e-mail communication dated March 20, 2005 from Shannon Davis to Jim Seger indicated that Mr. Davis had obtained information about company affiliations for much of the shore-based buying and processing industry..

[14] According to the Pacific Seafood Web site (http://www.pacseafood.com/welcome.html), "since 1983 Pacific Group has expanded from one processing and one distribution facility to over 20 operating units."

[15] http://www.bornstein.com/Locations.html

[16] This section assumes that a definition of "processing" will be developed that unambiguously identifies processors eligible to receive QS. The current definitions included in the alternatives forwarded for analysis do not appear to meet this standard.

[17] Identification of processing groups would be done using secondary data and through the use of key informant interviews.

assigned to a single processing group. All facilities would be assigned based on current relationships.

2) Divide processing groups into two subsets—large and small. For example, large processing units might be defined as those processing groups that account for more than one percent of total ex-vessel trawl groundfish purchases in any year. All receivers that are associated with a group that is defined as large would be considered large for purposes of the EIS analysis regardless of the amount of groundfish the individual facility purchased.
3) Group independent buyers into a single class.

This classification scheme would result in the following four processing classes of trawl-caught groundfish (including motherships):

- Large Shore-based Processing Groups (LSPG)—processing groups (processing facilities and associated buyers) that have accounted for more than X percent[18] of the ex-vessel value of shore-based processing of trawl groundfish in any given year.
- Small Shore-based Processors Groups (SSPG)—processing groups (processing facilities and associated buyers) that have never accounted for more than X percent[18] of the ex-vessel value of shore-based processing of trawl groundfish in any given year.
- Independent Buyers (IB)—receivers of groundfish that do not appear to meet the definition of a "processor" and do not appear to be associated with any processors through contractual or ownership linkages.[19]
- Motherships (MS)—processing vessels that have participated as processor in the mothership allocation of Pacific whiting. They are identified in the NORPAC At-Sea data sets.

Earlier drafts of this document, as well the presentation made to the Trawl IQ Workshop on April 18, 2006, indicated that processing classes would include a geographic component, e.g., Large Washington Processors or Small California Processors. Upon further consideration, the Consulting Team concluded that if IFQ allocations to processors are included in the preferred alternative, the processing classes documented in the EIS should reflect the types of entities that would receive shares. Rather than depicting processors as independent facilities, the analysis should recognize that the majority of processing is undertaken by multi-facility companies with locations distributed throughout the West Coast. Notwithstanding this consideration, the profiles of shore-based processing classes in this chapter show the geographic distribution of processing facilities and buying stations.

3.6.2 Condition Indicators for Processors of Trawl Groundfish

Indicators of the historical and baseline conditions of processors of trawl groundfish, including motherships and shore-based processors, include but are not necessarily limited to the following:

- Number of processors groups, facilities and buying stations
- Total purchases of trawl-caught groundfish by species
- Ex-Vessel Prices Paid
- Distribution of purchases by month
- Relative dependency of West Coast trawl groundfish

[18] This percentage would be fixed after processing group linkages are determined and data using the processing group definitions are examined

[19] Classification as an "independent buyer" would not necessarily be "proof" that the receiver is ineligible to receive QS. Actual eligibility would be determined during the QS application process once a trawl IFQ program was implemented. Nevertheless, the EIS analysis would make a reasonable effort to verify the classification.

- Relationships with harvesters
- Distribution of facilities and buying stations by community
- Wholesale value of production
- Operating costs
- Net revenues
- Product types and amounts by species
- Product recovery rates by product and species
- Operating days per year
- Number of processing crew

3.6.3 Summary of Past and Present Conditions of Trawl Groundfish Processors

This section provides a summary of participation of all processors of trawl groundfish in the West Coast fisheries. Detailed descriptions of each processing class are provided in Sections 3.6.4 – 3.6.4.4. This summary emphasizes total participation and purchases of groundfish in terms of volume and ex-vessel value by species. The section includes comparisons between the situation in 2005 (baseline condition) and conditions in the historical period (1994-2005).

3.6.3.1 Number of Processor Groups, Facilities and Buying Stations

Table 3-61 summarizes the participation of trawl groundfish processors groups by processor class. For shore-based processors the table indicates the number of processor groups as well as the number of processing facilities and associated buyers.

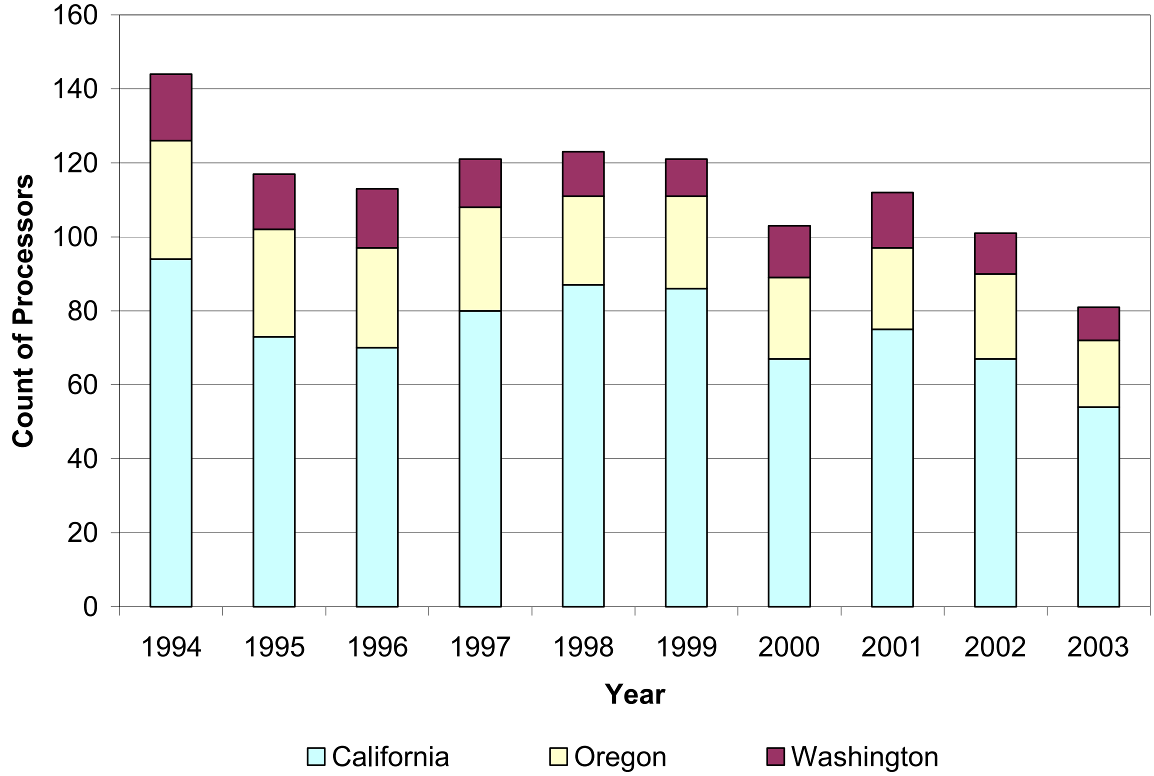
Table 3-61. Active Processors and Buyers by Processor Class, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Processor Class	Number of Groups or Facilities											
Large Shore-based Processor Groups (LSPG)												
Processing Facilities												
Associated Buyers												
Small Shore-based Processor Groups (LSPG)												
Processing Facilities												
Associated Buyers												
Independent Buyers												
Motherships												

Note: The sum of processing facilities and associated buyers will equal the total number of receivers.

Figure 3-7 shows the number of receivers of trawl groundfish by state. This includes all buyers, but may not include all processors if there are processors that are not also receivers. The figure is included to provide a perspective of the potential magnitude of the groundfish trawl processing sector.

Figure 3-7. Number of Receivers of Trawl Groundfish by State, 1994-2003[20]



Source: Data provided to the Consulting Team by Shannon Davis in October 2005.

3.6.3.2 Total Purchases of Trawl-Caught Groundfish by Species

This section documents the total volume and ex-vessel value of trawl-caught groundfish purchases. Tables show volumes and values by species and year for all processors, and volumes and value by species for the historical period and 2005 by processing class.

[20] Actual data in the EIS would use 1994-2005.

Table 3-62. Total Volume of Processor Purchases of Trawl Caught Groundfish by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	Trawl Groundfish Purchases (MT)												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-63. Total Ex-vessel Value of Processor Purchases of Trawl Caught Groundfish by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	Ex-vessel Value of Trawl Groundfish Purchases ($1,000 in 2005$)												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-64. Total Volume of Processor Purchases of Trawl Groundfish by Species, 1994-2005

Processor Class	LSPG		SSPG		IB		MS		All Classes	
Species	(MT)	Percent	(MT)	Percent	(MT)	Percent	(MT)	Percent	(MT)	Percent
Arrowtooth Flounder										
Bank Rockfish										
Black Rockfish OR-CA										
Black Rockfish WA										
Blackgill Rockfish										
Bocaccio Rockfish										
Canary Rockfish										
Chili/Eureka Rockfish										
Chilipepper Rockfish										
Cowcod										
Darkblotched Rockfish										
Dover Sole										
English Sole										
Lingcod										
Minor Rockfish (N)										
Other Flatfish										
Other Rockfish (N)										
Other Rockfish (S)										
Other Species										
Pacific Cod										
Pacific Ocean Perch										
Pacific Whiting										
Petrale Sole										
Redstripe Rockfish										
Sablefish										
Thornyhead (Lg.)										
Thornyhead (Sh.)										
Sharpchin Rockfish										
Shortbelly Rockfish										
Silvergrey Rockfish										
Splitnose Rockfish										
Widow Rockfish										
Yelloweye Rockfish										
Yellowmouth Rockfish										
Yellowtail Rockfish										

Table 3-65. Total Ex-Vessel Value (in 2005$) of Processor Purchases of Trawl Groundfish by Species, 2005

Processor Class	LSPG		SSPG		IB		MS		All Classes	
Species	$1,000	Percent	(MT)	Percent	(MT)	Percent	(MT)	Percent	(MT)	Percent
Arrowtooth Flounder										
Bank Rockfish										
Black Rockfish OR-CA										
Black Rockfish WA										
Blackgill Rockfish										
Bocaccio Rockfish										
Canary Rockfish										
Chili/Eureka Rockfish										
Chilipepper Rockfish										
Cowcod										
Darkblotched Rockfish										
Dover Sole										
English Sole										
Lingcod										
Minor Rockfish (N)										
Other Flatfish										
Other Rockfish (N)										
Other Rockfish (S)										
Other Species										
Pacific Cod										
Pacific Ocean Perch										
Pacific Whiting										
Petrale Sole										
Redstripe Rockfish										
Sablefish										
Thornyhead (Lg.)										
Thornyhead (Sh.)										
Sharpchin Rockfish										
Shortbelly Rockfish										
Silvergrey Rockfish										
Splitnose Rockfish										
Widow Rockfish										
Yelloweye Rockfish										
Yellowmouth Rockfish										
Yellowtail Rockfish										

Table 3-66. Average Ex-Vessel Prices Paid for Trawl Groundfish by Species and Processor Class, 1994-2005

Processor Class	LSPG	SSPG	IB	MS	All Classes
Species	Average Ex-vessel Prices Paid ($/pound in 2005$)				
Arrowtooth Flounder					
Bank Rockfish					
Black Rockfish OR-CA					
Black Rockfish WA					
Blackgill Rockfish					
Bocaccio Rockfish					
Canary Rockfish					
Chili/Eureka Rockfish					
Chilipepper Rockfish					
Cowcod					
Darkblotched Rockfish					
Dover Sole					
English Sole					
Lingcod					
Minor Rockfish (N)					
Other Flatfish					
Other Rockfish (N)					
Other Rockfish (S)					
Other Species					
Pacific Cod					
Pacific Ocean Perch					
Pacific Whiting					
Petrale Sole					
Redstripe Rockfish					
Sablefish					
Thornyhead (Lg.)					
Thornyhead (Sh.)					
Sharpchin Rockfish					
Shortbelly Rockfish					
Silvergrey Rockfish					
Splitnose Rockfish					
Widow Rockfish					
Yelloweye Rockfish					
Yellowmouth Rockfish					
Yellowtail Rockfish					

Table 3-67. Average Ex-Vessel Prices Paid for Trawl Groundfish by Species and Processor Class, 2005

Processor Class	LSPG	SSPG	IB	MS	All Classes
Species	Average Ex-vessel Prices Paid ($/pound in 2005$)				
Arrowtooth Flounder					
Bank Rockfish					
Black Rockfish OR-CA					
Black Rockfish WA					
Blackgill Rockfish					
Bocaccio Rockfish					
Canary Rockfish					
Chili/Eureka Rockfish					
Chilipepper Rockfish					
Cowcod					
Darkblotched Rockfish					
Dover Sole					
English Sole					
Lingcod					
Minor Rockfish (N)					
Other Flatfish					
Other Rockfish (N)					
Other Rockfish (S)					
Other Species					
Pacific Cod					
Pacific Ocean Perch					
Pacific Whiting					
Petrale Sole					
Redstripe Rockfish					
Sablefish					
Thornyhead (Lg.)					
Thornyhead (Sh.)					
Sharpchin Rockfish					
Shortbelly Rockfish					
Silvergrey Rockfish					
Splitnose Rockfish					
Widow Rockfish					
Yelloweye Rockfish					
Yellowmouth Rockfish					
Yellowtail Rockfish					

3.6.3.3 Distribution of Purchases

This section summarizes the distribution of trawl groundfish purchases by month over the historical period and in 2005 and summarizes ex-vessel prices paid by month. Section 3.4.3.4 summarizes total landings (volume and value) by month. The distribution of purchases by month is a key indicator because under a trawl IFQ program harvesters will likely change their fishing patterns to minimize incidental catch of overfished species.

Table 3-68. Trawl Groundfish Landings as a Percent of Volume by Month, 1994-2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Processor Class	Volume of Purchases by Species as Percent of Total Purchases of the Species											
LSPG												
SSPG												
IB												
MS												
All Processors												

Table 3-69. Trawl Groundfish Landings as a Percent of Volume by Month, 2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Processor Class	Volume of Purchases by Species as Percent of Total Purchases of the Species											
LSPG												
SSPG												
IB												
MS												
All Processors												

Table 3-70. Trawl Groundfish Landings as a Percent of Value by Month, 1994-2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Processor Class	Value of Purchases by Species as percent of Total Purchases of the Species											
LSPG												
SSPG												
IB												
MS												
All Processors												

Table 3-71. Trawl Groundfish Landings as a Percent of Value by Month, 2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Processor Class	Value of Purchases by Species as percent of Total Purchases of the Species											
LSPG												
SSPG												
IB												
MS												
All Processors												

Table 3-72. Ex-Vessel Prices Paid by Month by Species and Month, 1994-2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Species	**Ex-Vessel Price ($/pound in 2005$)**											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

3.6.4 Past and Present Conditions of Trawl Groundfish Processor Classes

3.6.4.1 Large Shore-based Processor Groups

Large Shore-based Processing Groups (LSPG) include those processing groups (processing facilities and associated buyers) that have accounted for more than X percent of the ex-vessel value of shore-based processing of trawl groundfish in any given year.

The tables below provide an example of the types of information that will be presented for each processor class.

Table 3-73. Active Large Processors and Associated Buyers, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Category	**Number of Processing Facilities/Associated Buyers**											
Processing Groups												
Processing Facilities												
Associated Buyers												

Note: The number of processing facilities and associated buyers will sum to the number of all receivers.

Table 3-74. Active Large Processors and Associated Buyers by Community, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Community	**Number of Processing Facilities/Associated Buyers**											
Community 1												
Community 2												

Table 3-75. Active Large Processors and Associated Buyers by 2-Month Period, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Community	**Number of Processing Facilities/Associated Buyers**											
Jan – Feb												
Mar – Apr												
May – Jun												
Jul – Aug												
Sep – Oct												
Nov – Dec												

Table 3-76. Total Volume of Large Processor Purchases of Trawl Caught Groundfish by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Species	Volume of Purchases (MT)											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-77. Ex-Vessel Value of Large Processor Purchases by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Species	Ex-Vessel Value ($ Millions in 2005$)											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-78. Ex-Vessel Price Paid by Large Shore-based Processors by Species, 1994-2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Species	Ex-Vessel Prices ($/pound in 2005$)											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-79. Ex-Vessel Price Paid by Large Shore-based Processors by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Species	Ex-Vessel Prices ($/pound in 2005$)											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-80. Product Types and Volume of Large Shore-based Processors by Species, 2005

Species	Fresh Fillet	Frozen Fillet	Frozen H&G	Frozen Headed	Surimi	Other	Total
	Product Weight (MT)						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							
Total of All Species							

Note: These data will be estimated based on key informant interviews and total landings by species. It is likely only 2005 information will be presented because product data are not regularly collected. Since motherships participate primarily in the whiting fishery, the table may be rearranged.

Table 3-81. Wholesale Value of Large Shore-based Processors by Product and Species, 2005

	Fresh Fillet	Frozen Fillet	Frozen H&G	Frozen Headed	Surimi	Other	Total
Species	Wholesale Value ($!,0000 in 2005$)						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							
Total of All Species							

Note: These data will be estimated based on key informant interviews and total landings by species. It is likely only 2005 information will be presented because product data are not regularly collected. Since motherships participate primarily in the whiting fishery, the table may be rearranged.

Figure 3-8 Landings of All Species of Large Shore-based Processors by Month, 1994-2005

This figure would be a line chart (one line) showing the volume of landings of all species by month from 1994-2005. Similar charts would be included showing landings volumes by individual species.

Table 3-82. Relative Dependency of Large Shore-based Processors on Limited Entry Trawl Fisheries, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
						Ex-Vessel Value ($ Millions in 25 $)						
LE Trawl Groundfish												
LE Fixed Gear Groundfish												
Open Access Groundfish												
Dungeness Crab												
Coastal Pelagics												
Salmon												
Other Fisheries												
All Fisheries												
						Percent of Ex-vessel Value						
LE Trawl Groundfish												
LE Fixed Gear Groundfish												
Open Access Groundfish												
Dungeness Crab												
Coastal Pelagics												
Salmon												
Other Fisheries												
All Fisheries												

Table 3-83. Annual Operating Days and Employment Estimates of Large Shore-based Processors, 1994-2005

Category	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Operating Days												
Number of Facilities												
No. of Ownership Entities												
Employment Estimate												

Table 3-84. Average Estimated Operating Costs, Wholesale Value of Production and Net Revenues of Large Shore-based Processors, 1994-2005

Category	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Payments to Labor												
Total Operating Costs												
Wholesale Value												
Net Revenues												

3.6.4.2 Small Shore-based Processor Groups

Small Shore-based Processors Groups (SSPG) include those processing groups (processing facilities and associated buyers) that have never accounted for more than X percent of the ex-vessel value of shore-based processing of trawl groundfish in any given year.

This section will contain a set of tables and figures similar to those provided for the Large Shore-based Processor Groups.

3.6.4.3 Independent Buyers

Independent buyers include those receivers of groundfish that do not meet the definition of "processor" and are not associated with any processors through contractual or ownership linkages.

This section will contain a set of tables and figures similar to those provided for the Large Shore-based Processor Groups. Because independent buyers do not actually process groundfish, process product information will not be included.

3.6.4.4 Motherships

This section provides a profile of motherships associated with the West Coast groundfish trawl fishery. In addition, processed products and wholesale values are discussed. Sources for some of the information referenced in this section have not yet been identified; consequently, the EIS analysis may have to create and administer instruments for acquiring or estimating the data.

The tables below provide an example of the types of information presented in this section.

Table 3-85. Number of Motherships, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005

Table 3-86. Total Volume of Purchases of Trawl Caught Groundfish by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Species	Volume of Purchases (MT)											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-87. Ex-Vessel Value of Mothership Purchases by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Species	Ex-Vessel Value ($ Millions in 2005$)											
Arrowtooth Flounder												
Bank Rockfish												
Black Rockfish OR-CA												
Black Rockfish WA												
Blackgill Rockfish												
Bocaccio Rockfish												
Canary Rockfish												
Chili/Eureka Rockfish												
Chilipepper Rockfish												
Cowcod												
Darkblotched Rockfish												
Dover Sole												
English Sole												
Lingcod												
Minor Rockfish (N)												
Other Flatfish												
Other Rockfish (N)												
Other Rockfish (S)												
Other Species												
Pacific Cod												
Pacific Ocean Perch												
Pacific Whiting												
Petrale Sole												
Redstripe Rockfish												
Sablefish												
Thornyhead (Lg.)												
Thornyhead (Sh.)												
Sharpchin Rockfish												
Shortbelly Rockfish												
Silvergrey Rockfish												
Splitnose Rockfish												
Widow Rockfish												
Yelloweye Rockfish												
Yellowmouth Rockfish												
Yellowtail Rockfish												

Table 3-88. Product Types and Volume Produced by Motherships by Species, 2005

Species	Fresh Fillet	Frozen Fillet	Frozen H&G	Frozen Headed	Surimi	Other	Total
	Product Weight (MT)						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							
Total of All Species							

Note: These data will be estimated based on key informant interviews and total landings by species. It is likely only 2005 information will be presented because product data are not regularly collected. Since motherships participate primarily in the whiting fishery, the table may be rearranged.

Table 3-89. Wholesale Value of Motherships by Product and Species, 2005

	Fresh Fillet	Frozen Fillet	Frozen H&G	Frozen Headed	Surimi	Other	Total
Species	Wholesale Value ($!,0000 in 2005$)						
Arrowtooth Flounder							
Bank Rockfish							
Black Rockfish OR-CA							
Black Rockfish WA							
Blackgill Rockfish							
Bocaccio Rockfish							
Canary Rockfish							
Chili/Eureka Rockfish							
Chilipepper Rockfish							
Cowcod							
Darkblotched Rockfish							
Dover Sole							
English Sole							
Lingcod							
Minor Rockfish (N)							
Other Flatfish							
Other Rockfish (N)							
Other Rockfish (S)							
Other Species							
Pacific Cod							
Pacific Ocean Perch							
Pacific Whiting							
Petrale Sole							
Redstripe Rockfish							
Sablefish							
Thornyhead (Lg.)							
Thornyhead (Sh.)							
Sharpchin Rockfish							
Shortbelly Rockfish							
Silvergrey Rockfish							
Splitnose Rockfish							
Widow Rockfish							
Yelloweye Rockfish							
Yellowmouth Rockfish							
Yellowtail Rockfish							
Total of All Species							

Note: These data will be estimated based on key informant interviews and total landings by species. It is likely only 2005 information will be presented because product data are not regularly collected. Since motherships participate primarily in the whiting fishery, the table may be rearranged.

Table 3-90. Relative Dependency of Motherships on Limited Entry Trawl Fisheries, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
							Ex-Vessel Value ($ Millions in 25 $)					
LE Trawl Groundfish												
Other West Coast												
Alaska Fisheries												
All Fisheries												
							Percent of Ex-vessel Value					
LE Trawl Groundfish												
Other West Coast												
Alaska Fisheries												
All Fisheries												

Note: Information for Alaska fisheries will be obtained from NOAA Fisheries Alaska Regional Office.

Table 3-91. Average Estimated Operating Costs and Net Revenues of Motherships in the West Coast Groundfish Trawl Fishery, 1994-2005

Category	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Number of operating days													
Number of crew													
Payments to labor (2005 $)													
Operating Costs (2005 $)													
Wholesale Value (2005 $)													
Net Revenues (2005 $)													

Note: Cost and revenue information may only be available for 2005.

3.7 Non-Trawl Commercial Harvesters

While non-trawl vessels and their owners and crew would not be directly affected by a trawl IFQ program, they may be indirectly affected in several ways. The most obvious indirect effects are the economic impacts of spillovers resulting from fleet consolidation. If the trawl fleet consolidates, vessels and crew members no longer employed in trawl fisheries will potentially be able to switch into non-trawl fisheries. Non-trawl fisheries will also be affected indirectly because the management action taken with respect to the trawl fleet is likely to influence future actions taken with respect to non-trawl vessels. The analysis of the non-trawl segment of the fish harvesting component will require further specification of non-trawl categories, e.g., limited entry longline vessels, non-licensed vessels, dive fisheries, etc. Vessel categories previously employed in Council models of the fishery will form the basis of this specification.[21]

3.7.1 Potentially Affected Non-Trawl Commercial Harvesters

Several classes of non-trawl commercial harvesters are included in the analysis based primarily on the non-trawl fisheries in which trawl permit holders currently operate or may potentially operate under a trawl IFQ program. While final specification of the potentially affected non-trawl harvesters will be made in Phase 2, the following represents an initial list of these indirectly affected harvesters.

[21] Radtke and Davis (2003) define 12 non-trawl fish harvesting vessels types in the Fishery Economic Assessment Model (FEAM)

- Limited entry fixed gear harvesters
- Directed open access fixed gear harvesters
- Exempted trawl incidental open access harvesters
- Dungeness crab harvesters
- Coastal pelagic species harvesters
- Salmon troll harvesters
- Highly migratory species harvesters

A trawl IFQ program is likely to lead to fleet consolidation. Those that leave the fishery and are able to keep their vessels may expand their effort in other fisheries to which they access. For example, a limited entry trawl permit holder that also has a limited entry fixed gear permit may choose to sell the initial allocation of IFQs and use the money to expand effort in the limited entry fixed gear fishery. If the total OY available for the limited entry fixed gear fishery is set, this additional investment could have a negative impact on existing participants in the limited entry fixed gear fishery.

3.7.2 Condition Indicators for Non-Trawl Commercial Harvesters

Indicators of the historical and baseline conditions of non-trawl commercial harvesters are similar to those described for trawl catcher vessels, but because these vessels are likely to be only indirectly affected, the number of indicators has been reduced to the following:

- Number of participating catcher vessels
- Landings, ex-vessel revenues and ex-vessel prices by species
- Distribution of landings by month
- Geographic distribution of effort
- Distribution of ex-vessel revenue by permit holder residence

3.7.3 Past and Present Conditions of Non-Trawl Commercial Harvester Classes

3.7.3.1 Limited Entry Fixed Gear Harvesters

Limited entry fixed gear harvesters may be indirectly affected by a trawl IFQ program because many limited entry trawl permit holders also participate in the limited entry fixed gear fishery. In addition, a trawl IFQ program may allow trawl QP to be utilized in the fixed gear fisheries.

3.7.3.1.1 Participation and Landings

Table 3-92 shows the number of active permit holders in the limited entry fixed gear fishery.

Table 3-92. Number of Permit Holders in the Limited Entry Fixed Gear Fishery, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	Number of Permit Holders											
Active FG only Permit Holders												
Active FG & Trawl Permit Holders												
Latent Permit Holders												
All Permit Holders												

Table 3-93. Volume of Landings in the Limited Entry Fixed Gear Fishery by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Total Landings (MT)**												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-94. Ex-Vessel Value in the Limited Entry Fixed Gear Fishery by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Total Ex-Vessel Value ($1,000 in 2005$)**												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-95. Ex-Vessel Prices in the Limited Entry Fixed Gear Fishery by Species, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Ex-Vessel Price ($/pound in 2005$)**												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Table 3-96. Total Ex-Vessel Value of Landings in the Limited Entry Fixed Gear Fishery, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	Total Ex-Vessel Value ($1,000 in 2005$)											
FG only Permit Holders												
FG & Trawl Permit Holders												
All Permit Holders												

Table 3-97. Average Ex-Vessel Value per Vessel in the Limited Entry Fixed Gear Fishery, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	Average Ex-Vessel Value per Vessel ($1,000 in 2005$)											
FG only Permit Holders												
FG & Trawl Permit Holders												
All Permit Holders												

3.7.3.1.2 Distribution of Landings

Figure 3-9 through Figure 3-13 show landings by month of major fixed gear species from 1994-2005. On average, over 90 percent of the revenue in the fixed gear fishery is represented in the figures. The temporal distribution of fishing effort will be an important indicator in the ability of trawl IFQ holders to split time between the fixed gear fishery and trawl fishery. If the timings of the fisheries coincide, the probability that vessels will participate in both fisheries diminishes.

Figure 3-9. Sablefish Landings in the Limited Entry Fixed Gear Fishery by Month, 1994-2005

Figure 3-10. Selected Rockfish Species Landings in the Limited Entry Fixed Gear Fishery by Month, 1994-2005

Figure 3-11. Thornyhead Landings in the Limited Entry Fixed Gear Fishery by Month, 1994-2005

Figure 3-12. Cabezon Landings in the Limited Entry Fixed Gear Fishery by Month, 1994-2005

Figure 3-13. Spiny Dogfish Landings in the Limited Entry Fixed Gear Fishery by Month, 1994-2005

3.7.3.1.3 Geographic Distribution of Fishing Effort

This section discusses the geographic distribution of effort in the limited entry fixed gear fishery. It is anticipated that the extent that the geographic distribution of effort in fixed gear fishery overlaps with the geographic distribution of effort in the trawl fishery, the greater the likelihood that the alternatives will affect the limited entry fixed gear fishery.

Table 3-98. Volume of Landings Limited Entry Fixed Gear Fishery by Management Area, 1994-2005.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Volume of Landings (MT)**												
Vancouver													
Columbia													
Eureka													
Monterey													
Conception													

Table 3-99. Ex-Vessel Value of Landings in the Limited Entry Fixed Gear Fishery by Management Area, 1994-2005.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Ex-Vessel Value ($1,000 in 2005$)**												
Vancouver													
Columbia													
Eureka													
Monterey													
Conception													

3.7.3.1.4 Distribution of Ex-vessel Revenue by Residence of Permit Holder

A description of the distribution of ex-vessel revenue by the community of residence of limited entry fixed gear permit holders allows community impacts to be identified.

Table 3-100. Ex-Vessel Value of Limited Entry Fixed Gear Permit Holders by Community of Residence, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Community	**Ex-Vessel Value ($1,000 in 2005$)**											
Community 1												
Community 2												
Community XXX												

3.7.3.2 Directed Open Access Fixed Gear Harvesters

This section will describe the directed open access fixed gear harvesting sector. The format of this section and the information provided will be similar to the section for limited entry fixed gear fleet.

3.7.3.3 Exempted Trawl Incidental Open Access Harvesters

This section will describe the exempted trawl open access harvesting sector. The format of this section and the information provided will be similar to the section for limited entry fixed gear fleet

3.7.3.4 Dungeness Crab Harvesters

This section will describe the Dungeness crab harvesting sector. The format of this section and the information provided will be similar to the section for limited entry fixed gear fleet.

3.7.3.5 Highly Migratory Species Harvesters

This section will describe the highly migratory species harvesting sector. The format of this section and the information provided will be similar to the section for limited entry fixed gear fleet.

3.7.3.6 Salmon Troll Harvesters

This section will describe the commercial salmon troll harvesting sector. The format of this section and the information provided will be similar to the section for limited entry fixed gear fleet.

3.8 Buyers and Processors that do Not Purchase Trawl Groundfish

This section describes buyers and processors that do not purchase trawl groundfish (hereafter referred to as Other Buyers and Processors). Because Other Buyers and Processors are not involved in the West Coast groundfish trawl fishery they will not be directly affected by a trawl IFQ program. However, these buyers and processors would be indirectly affected if a trawl IFQ program restricts their ability to enter the trawl-caught groundfish processing market in the future.[22] They would also be affected if higher profits for processors of trawl groundfish encourage these processors to increase their level of activity in non-trawl groundfish fisheries or non-groundfish fisheries.

3.8.1 Condition Indicators for Other Buyers and Processors

Indicators of the historical and baseline conditions of Other Buyers and Processors include but are not necessarily limited to the following:

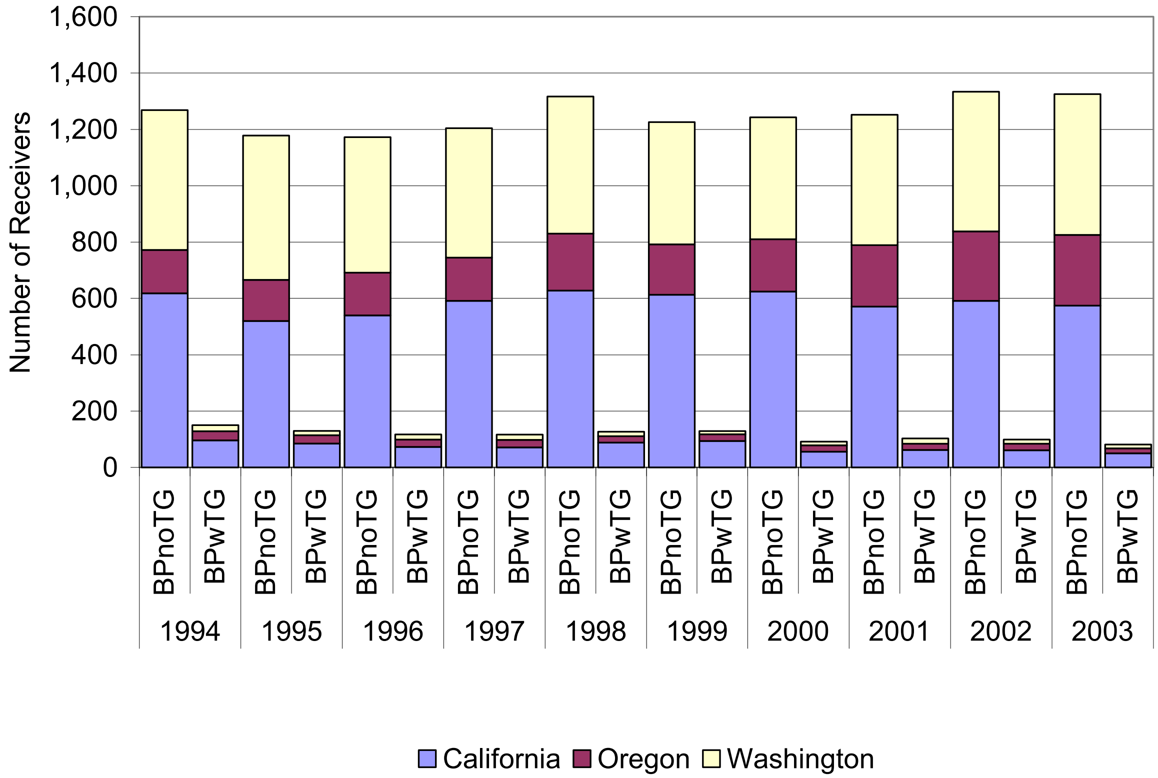
- Number of affected buyers and facilities
- Total purchases by fishery
- Relative market share compared to Trawl Groundfish Processors
- Geographic distribution of participation

3.8.2 Past and Present Conditions of Other Buyers and Processors

Figure 3-14 shows the total number of receivers of West Coast harvests. Other Buyers and Processors (labeled as BPnoTG in the figure) are those receivers that did not purchase trawl groundfish, while trawl receivers (labeled as BPwTG in the figure) include all receivers that purchased trawl groundfish. The number of BPnoTG ranged from 1,172 in 1996 to 1,334 in 2002. The number of BPwTG ranged from 150 in 1994 to 81 in 2003.

[22] Because entry into the trawl fishery by harvesting vessels is already limited, non-trawl vessels are generally only indirectly affected by the alternatives.

Figure 3-14. Buyers and Processors of West-Coast Species, 1994-2003



Note: BPnoTG are buyers and processors that do not purchase trawl groundfish; TGwBP are trawl groundfish buyers and processors.

Although Other Buyers and Processors are discussed as a single group, the information provided shows the geographic distribution of participation. Table 3-101 through Table 3-108 summarize the historical and baseline conditions of Other Buyers and Processors in terms of various indicators.

Table 3-101. Participation of Other Buyers and Processors by Fishery, 1994-2005

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Fishery							Number						
Groundfish													
Coastal pelagic													
Crab/lobster													
Halibut													
Highly migratory													
Other													
Salmon													
Sea urchins													
Shrimp													
Total													

Table 3-102. Volume of Landings of Other Buyers and Processors by Fishery, 1994-2005

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Fishery						Landings (MT)							
Groundfish													
Coastal pelagic													
Crab/lobster													
Halibut													
Highly migratory													
Other													
Salmon													
Sea urchins													
Shrimp													
Total													

Table 3-103. Ex-Vessel Value of Other Buyers and Processors by Fishery, 1994-2005

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Fishery						Ex-Vessel Value ($1,000 in 2005$)							
Groundfish													
Coastal pelagic													
Crab/lobster													
Halibut													
Highly migratory													
Other													
Salmon													
Sea urchins													
Shrimp													
Total													

Table 3-104. Relative Market Share of Other Buyers and Processors by Fishery, 1994-2005

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Fishery						Ex-Vessel Value as a Percent of Total Value							
Groundfish													
Coastal pelagic													
Crab/lobster													
Halibut													
Highly migratory													
Other													
Salmon													
Sea urchins													
Shrimp													
Total													

Note: This table uses total ex-vessel value in the fishery as an indicator of market share. The total market is defined as the value of purchases of both BPnoTG P and trawl groundfish processors in a given year.

Table 3-105. Participation of Other Buyers and Processors by Fishery and Region, 1994-2005

Region	No. WA	So. WA	No. OR	So. OR	No. CA	So. CA	Total
Fishery	Number						
Groundfish							
Coastal pelagic							
Crab/lobster							
Halibut							
Highly migratory							
Other							
Salmon							
Sea urchins							
Shrimp							
Total							

Table 3-106. Participation of Other Buyers and Processors by Fishery and Region, 2005

Region	No. WA	So. WA	No. OR	So. OR	No. CA	So. CA	Total
Fishery	Number						
Groundfish							
Coastal pelagic							
Crab/lobster							
Halibut							
Highly migratory							
Other							
Salmon							
Sea urchins							
Shrimp							
Total							

Table 3-107. Ex-Vessel Value of Other Buyers and Processors by Fishery and Region, 1994-2005

Region	No. WA	So. WA	No. OR	So. OR	No. CA	So. CA	Total
Fishery	Ex-Vessel Value ($1,000 in 2005$)						
Groundfish							
Coastal pelagic							
Crab/lobster							
Halibut							
Highly migratory							
Other							
Salmon							
Sea urchins							
Shrimp							
Total							

Table 3-108. Ex-Vessel Value of Other Buyers and Processors by Fishery and Region, 2005

Region	No. WA	So. WA	No. OR	So. OR	No. CA	So. CA	Total
Fishery	Ex-Vessel Value ($1,000 in 2005$)						
Groundfish							
Coastal pelagic							
Crab/lobster							
Halibut							
Highly migratory							
Other							
Salmon							
Sea urchins							
Shrimp							
Total							

3.9 Recreational Harvesters of Groundfish

Recreational harvesters of groundfish may be indirectly affected by a trawl IFQ program. Perhaps the most significant way in which recreational harvesters could be affected is through the fishery management process. If trawl groundfish harvesters and processors become more profitable under a trawl IFQ program, their level of participation and influence in Council and NMFS management processes may increase. This additional participation could ultimately result in increased constraints on the growth potential of the recreation fisheries. In addition, the possibility that trawl harvesters will be more flexible in their harvesting pattern under a trawl IFQ program may affect the number of trawl vessels on the grounds at any given time.

3.9.1 Condition Indicators for Recreational Harvesters of Groundfish

Based on the availability of data on the recreational fishery for groundfish, the indicators of the historical and baseline conditions of recreational harvesters will include the following:

- Volume of recreational groundfish landings by species and year
- Distribution of recreational groundfish landings by two-month periods
- Geographic distribution of recreational groundfish landings

3.9.2 Past and Present Conditions of Recreational Harvesters of Groundfish

Table 3-109 shows the volume of landings in the recreational groundfish fishery by species and year. The table indicates data for 1994-2005, but the availability of data may limit the actual amount of information shown. In addition, some groundfish species are not harvested in recreational fisheries. The table will only include those species that are regularly harvested in the groundfish recreational fishery.

Table 3-109. Volume of Landings in the Recreational Groundfish Fishery by Species and Year, 1994-2005

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	**Volume of Landings (MT)**												
Arrowtooth Flounder													
Bank Rockfish													
Black Rockfish OR-CA													
Black Rockfish WA													
Blackgill Rockfish													
Bocaccio Rockfish													
Canary Rockfish													
Chili/Eureka Rockfish													
Chilipepper Rockfish													
Cowcod													
Darkblotched Rockfish													
Dover Sole													
English Sole													
Lingcod													
Minor Rockfish (N)													
Other Flatfish													
Other Rockfish (N)													
Other Rockfish (S)													
Other Species													
Pacific Cod													
Pacific Ocean Perch													
Pacific Whiting													
Petrale Sole													
Redstripe Rockfish													
Sablefish													
Thornyhead (Lg.)													
Thornyhead (Sh.)													
Sharpchin Rockfish													
Shortbelly Rockfish													
Silvergrey Rockfish													
Splitnose Rockfish													
Widow Rockfish													
Yelloweye Rockfish													
Yellowmouth Rockfish													
Yellowtail Rockfish													

Figure 3-15 and Figure 3-16 shows recreational groundfish landings by month from 1994-2005. Additional figures may be developed depending on the number and volume of species in the recreational catch data.

Figure 3-15. Landings of Rockfish in the Recreational Fishery by Two-Month Period, 1994-2005

Figure 3-16. Landings of Other Groundfish in the Recreational Fishery by Two-Month Period, 1994-2005

Table 3-110 shows the volume of recreational groundfish landings by state from 1994-2005. It is uncertain whether catch data for a more detailed geographic level are available.

Table 3-110. Volume of Recreation Groundfish Landings by State, 1994-2005.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Species	Volume of Landings (MT)												
Washington													
Oregon													
Northern California													
Southern California													

3.10 Communities

This section will summarize the community profiles presented in Appendix B: Social Impact Assessment Technical Appendix and will place relevant fishery activity in a community setting. While the community profiles in Appendix B provide a range of descriptive and context information, the profiles in this section are brief (1-2 pages each) and summarize different types of relevant community fisheries engagement information, such as the number of participating vessels by sector, landings, and total revenue, among others, along with information that will provide a quick gauge of fishery dependency by community, including relevant fishery diversity information as well as economic diversity information at the community level.

3.10.1 Potentially Affected Communities

Individual industry sectors outlined in previous sections are distributed across a range of communities. Some communities have marked concentrations of vessel ownership or are homeport to clusters of vessels; some communities are the location of processing effort; and some communities have concentrations of fishery support service businesses and employment. Individual communities may be host to single or multiple sector activities with varying degrees of intensity of activity, may have a greater or lesser degree of engagement in the fishery through employment of residents, and may have a greater or lesser degree of dependency on the fishery as a result of numerous factors, including such fundamental community attributes as relative size and diversity of private sector-driven economic base and/or sources of public revenues. Communities may be directly and/or indirectly affected by the Action Alternatives in a variety of ways.

As described in more detail in Appendix B, the choice of specific communities and regions to be profiled in this section will be driven by data availability (e.g., information on where relevant trawl vessels are located, port landing data, or the like) and by data confidentiality considerations. Looking at trawl vessel distribution as an example, within the state of Washington a couple of different groupings are possible. Only two communities, Port Angeles (with four vessels) and Westport (with seven vessels) have three or more vessels each, allowing community-level data discussions. Only two other Washington communities are listed as having any relevant catcher vessels. Blaine has an additional two vessels, so information from those vessels could be lumped with those from Port Angeles into a Northern Puget Sound area that could then be described as a region if the desired outcome was to include all vessel information from that region. Similarly, information from the only other Washington vessel located in Ilwaco/Chinook could be lumped with those from Westport to provide an all-inclusive Coastal Washington South and Central regional discussion, following the groupings utilized in previous groundfish EIS analyses. The advantage of staying with community-specific data is the ability to ultimately better describe impacts (and variations of impacts) at the community level, while the advantage of utilizing regions is to allow for an analysis that accommodates all available information.

Continuing the vessel-based example, Oregon trawl vessel communities that could be described on an individual community basis include Astoria (32 vessels), Newport (20 vessels), Coos Bay (16 vessels), and Brookings (6 vessels). Florence, with one vessel, could be lumped with Coos Bay, and similarly Tillamook, with two vessels, could be lumped with Astoria for a more regional coverage and for the sake of completeness.

Within California, a total of nine communities feature three or more trawl vessels that would, in turn, allow for community level discussions. These are Crescent City (three vessels), Eureka (nine vessels), Fort Bragg (nine vessels), Princeton/Half Moon Bay (nine vessels), San Francisco (five vessels), Monterey (four vessels), Moss Landing (five vessels), Avila (three vessels), and Morro Bay (three vessels). Only two California communities have less than three vessels, precluding a community level data discussion: Bodega Bay (one vessel) and Santa Cruz (two vessels). These communities could be lumped with others for regional groupings and, if appropriate and desired, some of the other communities could be further be lumped to simplify the analysis (e.g., Avila and Morro Bay have been lumped into a single region in earlier analyses).

Different patterns of community confidentiality restrictions emerge when other data sets or groupings are utilized, such as landings by ports or distribution of permits (as opposed to vessels), as noted in Appendix B. Further, when common ownership is taken into consideration, analytic flexibility declines as confidentiality restrictions expand. Ultimately, we would be seeking analytic power and utility within individual communities or groups of communities with common attributes to allow for a production of the best available information regarding potential community and social impacts for consideration by decision makers. The decision regarding appropriate aggregations of communities will also be informed by community or regional level information on processing and support service entities as well as data on vessels or permit holders or landings themselves. It is likely that after the detailed data runs are produced, classes of communities or a typology of communities will be constructed to reduce analytic complexity while capturing the range of likely social impacts. Individual community variability characterization will be retained, to the extent possible, in the detailed information presented in Appendix B. It will also be important in this section to summarize the community level distribution changes that have occurred since the implementation of the buyback program in order to set the stage for subsequent cumulative impact analysis.

3.10.2 Condition Indicators for Communities

Indicators of the historical and baseline conditions of communities include but are not necessarily limited to the following:

- Community distribution of vessel and permit ownership
- Community distribution of landings and vessel activity
- Community distribution of processing related activity
- Community distribution of fishery related employment by sector
- Community distribution of fishery related income
- Community distribution of fishery related public revenues
- Community distribution of fishery related support service demand (qualitative)

The historical and baseline conditions of communities will also be summarized with respect to the overall engagement and dependency of trawl related fishing communities based on the above indicators.

3.11 Tribes

Tribes are proposed as a separate potentially affected stakeholder group from communities. Tribal groundfish fisheries are regulated by the participating tribes themselves, with the type of overall allocations varying by groundfish species or species group. In the case of sablefish, for example, tribal allocations account for 10 percent of the northern area OY, while whiting tribal allocations are based on a formula subject to a sliding scale adjustment. Other groundfish are allocated on biannual basis in a process that includes Council coordination. In short, while not necessarily directly affected by federal and state management measures, tribal entities are directly involved in the Council process and craft their groundfish management measures in cooperation with federal and state managers. Further, tribes and tribal related entities may be direct participants in the non-tribal fisheries subject to management under the proposed alternatives (as may any other entity) and it is known that at least some tribes are involved with fisheries support service business ventures that rely to at least some degree on potentially affected non-tribal fishing entities.

3.11.1 Potentially Affected Tribes

Four Indian tribes in Western Washington exercise treaty rights to harvest groundfish and other marine species in the Pacific Ocean off the Northwest Coast: the Hoh, Makah, and Quileute Tribes and the Quinault Indian Nation. Each has reservation lands, but their fishing is not confined to the reservation. Each of these tribes has usual and accustomed fishing areas (U & A) that extend into the groundfish fishery management area.

3.11.1.1 The Hoh Tribe

The 443-acre Hoh reservation is located in Jefferson County, on the Pacific Coast of northern Washington. The reservation lies within the boundaries of the Olympic National Park, and in the area of the Hoh River drainage system. The Hoh River empties into the Pacific and serves as the reservation's northern boundary. The Hoh U&A within the FMA is between 47°54'18 N (Quillayute River) and 47°21'00 N (Quinault River) and east of 125°44'00 W. Currently, Hoh tribal members harvest shellfish, smelt, sturgeon, sablefish, rockfish, Dungeness crab, salmon (spring, summer, and fall chinook, and fall coho), steelhead, trout, and halibut within their U & A.

3.11.1.2 The Makah Tribe

The 27,950-acre Makah reservation is located on the northwestern tip of Washington's Olympic Peninsula in Clallam County. It includes Cape Flattery and Koitlah Point. Vancouver Island, Canada is across the Strait of San Juan de Fuca. The reservation lies 70 miles west of Port Angeles, and 17 miles from the nearest neighboring community, Sekiu. Unlike many other tribes in the US, the Makah Tribe still holds title to a substantial portion of their ancestral land base, engendering a high degree of continuity in both place-oriented identity and subsistence practice (Sepez 2000). The Makah U&A includes Washington state statistical area 4B and that portion of the FMA north of 48°02'15 N (Norwegian Memorial) and east of 125°44'00 W. Currently, Makah tribal members harvest halibut, whiting, rockfish, lingcod, sablefish, flatfish, salmon, steelhead, sturgeon, shellfish, other groundfish, and gray whales within their U&A. Makah members currently operate groundfish trawlers and a whiting mothership.

3.11.1.3 The Quileute Tribe

The 694-acre Quileute reservation is located entirely in Clallam County, Washington, on the south banks of the Quillayute River along the Pacific Ocean. It is surrounded on three sides by the Olympic National Park, and the fourth side of the Reservation is on the Pacific Ocean—First Beach. The headquarters for the Tribe is in La Push, and most Quileute live in Clallam County; however, some enrolled members live in other counties of the state (e.g., adjacent Jefferson to the south) and even outside Washington. The Quileute Tribe has regulated its marine and freshwater fishery for many years. The Quileute today commercially harvest groundfish (including halibut, sablefish, lingcod, and rockfish), Dungeness crab, tuna, smelt, salmon, and steelhead from the marine environment. Seals, sea lions, bivalves (California and blue mussels, razor clams, littlenecks, and butter clams), and other invertebrates are harvested ceremonially and for subsistence. In fresh water, they harvest smelt, salmon, trout, and steelhead commercially as well as for ceremony and subsistence. Salmonids include chinook, coho, sockeye, steelhead, sea trout, and cutthroat trout.

3.11.1.4 The Quinault Indian Nation

The 208,150 acre Quinault Reservation is located in Grays Harbor and Jefferson Counties on the western shore of the Olympic Peninsula. The western boundary of the triangular reservation is the Pacific Ocean coastline, stretching about 26 miles. The Quinault Indian Nation has regulated its river fisheries since 1916, both for a commercial and sports fishery. It has regulated its off-reservation river fisheries and ocean fisheries since 1974. As a self-regulating tribe, the Tribe also regulates the fishery and all other activities on Lake Quinault and its Reservation beaches. Along with the rivers and streams that run through the Quinault Reservation, Lake Quinault is entirely within the Reservation. Reservation beaches and Lake Quinault are closed to non-members except by permission of the Quinault government. The Tribe has on occasion closed its waters to all fishing and prohibited certain types of gear in order to conserve fish runs.

3.11.2 Condition Indicators for Tribes

Indicators of the historical and baseline conditions of tribes include but are not necessarily limited to the following:

- Coastal distribution of fishing activity
- Distribution of income derived from fishing activities

3.12 Input Suppliers

Businesses that supply inputs to groundfish trawl harvesters may be indirectly affected by a trawl IFQ program if the program causes behavioral changes in trawl groundfish harvesting operations.[23] However, the indirect effects on input suppliers may be minimal for two reasons. First, the current management regime has already essentially eliminated the race for fish in the West Coast groundfish trawl fishery,[24] and second, input suppliers would likely be much more affected by a change in OY level than by a trawl IFQ program. Notwithstanding these caveats, the implementation of IFQ programs in other fisheries have had significant effects on input suppliers, and therefore this stakeholder group is included.

Estimating impacts on input suppliers is complicated by the fact that many of the vessels and processors in the trawl groundfish sectors are not wholly dependent on the West Coast groundfish trawl fishery. For example, many (if not most) of the vessels that participate in the whiting fishery also participate in the Alaska pollock fishery. Therefore, while a vessel may exit the West Coast groundfish trawl fishery it may remain active in other fisheries and continue to purchase a similar level of fixed or annual inputs. For example, moorage expenditures would only be affected if a vessel that leaves the West Coast groundfish trawl fishery severs all ties with the West Coast. To simplify the analysis, it is assumed here that the only inputs that would be affected by a trawl IFQ program are those related to a vessel's level of fishing production, i.e., variable inputs.

The initial list[25] of variable inputs of trawl vessels likely to be affected by the alternatives includes fuel, food, trawl gear, and observers.[26] For example, fuel expenditures are among the largest expense categories for fishing vessels. Under a trawl IFQ program, fish harvesters are expected to be better able to optimize their fishing activities over the course of the year, thereby decreasing fuel expenditures. As a result, marine fuel suppliers are likely to see a change in the demand for their product. Trawl gear suppliers are likely to be indirectly affected by a trawl IFQ program. If there is considerable consolidation of the fleet, fewer trawl gear sets would be needed. On the other hand, consolidation would also mean that the gear on the vessels remaining in the fishery will see greater use during the year. Finally, if the remaining trawl harvesters become more profitable under a trawl IFQ program, they are more likely to replace and upgrade their gear more often.

Although crew labor is generally considered a variable input, it is discussed in the above descriptions of potentially affected vessels. While fixed inputs are assumed to be unaffected by a trawl IFQ program, it is likely that a program would create demand for the services of permit and IFQ brokers.

3.12.1 Condition Indicators for Input Suppliers

Indicators of the historical and baseline conditions of input suppliers include but are not necessarily limited to the following:

- Estimated fuel sales to trawl groundfish harvesters and processors and the geographic distribution of major marine fuel supply businesses.

[23] The Consulting Team does not anticipate that a trawl IFQ program would have a measurable effect on the demand for inputs by trawl groundfish processors.

[24] A race for fish typically creates an economic advantage for input suppliers.

[25] It could be argued that other inputs would be affected by a trawl IFQ program. This initial list could be augmented if it is determined that the use of other inputs may change significantly.

[26] Observers are included in this section because firms that provide observers are properly considered input suppliers. Inclusion of observers in this section does not imply that vessels would or would not be required to pay for observer coverage.

- Estimated food sales to trawl groundfish harvesters and the geographic distribution of major food supply businesses.
- Estimated annual sales of trawl gear in the West Coast groundfish trawl fishery and the geographic distribution of major trawl gear suppliers.
- Observer expenses, observer counts, and geographic distribution of observer supply businesses.
- Number of permit transactions and the geographic distribution of permit brokerages.

The lack of expenditure data may limit the ability of the analysis to fully describe the conditions of input suppliers.

3.12.2 Past and Present Conditions of Input Suppliers

This section describes the historical and baseline conditions of input suppliers as they relate to the trawl groundfish harvesting and processing sectors. A separate sub-section will be devoted to each of the input supply sectors described in Section 3.12.1.

3.12.2.1 Fuel Suppliers

This section estimates fuel sales by volume and value in recent years. The primary source of information is the NMFS vessel expenditure survey that is currently in progress.

This section also utilizes landings data from PacFIN to describe the geographic distribution of fuel sales based on the assumption that fishing vessel operators purchase the majority of their fuel in the community in which fish are landed.

3.12.2.2 Trawl Gear Suppliers

This section documents past and present conditions of trawl gear suppliers including estimates of sales by year to West-Coast groundfish trawlers and the geographic location of trawl gear suppliers.

3.12.2.3 Suppliers of Groundfish Observers

Currently, most observers are contracted workers of specialized businesses that coordinate with NMFS to supply observers as needed. This section describes the past and present conditions of observer supply companies, including the number of observer days by year in the West Coast groundfish trawl fishery, number of observers used per year, amount paid to observer companies and the geographic location of observer companies.

3.12.2.4 Permit Brokerages

Currently, there are specialized businesses that broker fishing permits. This section describes the past and present conditions of permit brokerages, including the number and geographic location of these businesses.

3.13 Wholesalers and Retailers

Wholesale and retail suppliers of groundfish would be indirectly affected by a trawl IFQ program to the extent that there are changes in groundfish product variety and groundfish product flows generated by trawl groundfish processors.

The transition to an IFQ program in other fisheries has typically created significant changes in the timing of harvests and types of products generated. These impacts are less likely in the West Coast groundfish trawl fishery because the fishery does not currently experience a race for fish. Cumulative trip limits spread harvests out over time, thereby generally preventing market gluts.

It is possible that a trawl IFQ program would create incentives to decrease the period over which the harvest of a particular species take place, and therefore would lead to greater variances in product flow. For example, in an effort to maximize harvests of petrale sole while staying within overfished species constraints, harvesters and processor may choose to limit petrale sole harvest to periods when incidental catch rates are lowest. This type of behavioral change would affect wholesalers and retailers.

It is also possible that wholesalers and retailers, that are also trawl groundfish buyers and processors, may have be able to increase their relative market share because that may experience greater certainty of supplies and increasing profits.

An additional possible impact on wholesale and retail distributors could result from QS allocation options that allocate harvesting quota shares to processors. In general, the options would not provide allocations to independent buyers of groundfish, some of which may be important sources of groundfish for certain wholesalers and retailers. By not receiving shares of the fishery, the ability of independent buyers to buy fish and supply wholesalers and retailers that are currently dependent upon them may be constrained.

3.13.1 Condition Indicators for Wholesalers and Retailers

There are far fewer wholesale businesses that deal with trawl groundfish than retail outlets. Therefore, different indicators are developed for the two groups.

Indicators of the historical and baseline conditions of wholesale businesses include the following:

- Delineation of wholesale businesses dealing with trawl groundfish
- Estimated market share of major wholesale businesses dealing with trawl groundfish
- Relative dependence of major wholesale businesses on trawl groundfish

Indicators of the historical and baseline conditions of retail businesses include the following:

- Types and number of retail businesses selling trawl groundfish

Data documenting the activities of wholesalers and retailers with respect to trawl groundfish are not known to exist. Therefore, the description of the past and present conditions of wholesalers and retailers of trawl groundfish is largely qualitative, and relies largely on key informant interviews.

3.14 Consumers

This section describes the past and present conditions of the retail market for the major species groups harvested in the West Coast groundfish trawl fishery.[27] Consumers of West Coast trawl groundfish may be indirectly affected by a trawl IFQ program if the prices, quality or availability of groundfish products change. As indicated in Section 3.13, cumulative trip limits in the West Coast groundfish trawl fishery already spread out harvests and allow processors to provide a wide variety of products to meet consumer demand. Therefore, the impacts of a trawl IFQ program on the market for trawl groundfish may be minimal.

3.14.1 Condition Indicators for Consumers

Indicators of the historical and baseline conditions of the market for trawl groundfish include the following:

- Product types and amounts by species group
- Retail product prices by species group

Data documenting the market for trawl groundfish are not known to exist. Therefore, the description of the past and present conditions of this market is largely qualitative, and relies largely on key informant interviews.

3.15 General Public

Marine and coastal ecosystems are among the most productive natural systems on earth and provide a wide range of benefits to humans (National Research Council 2001; Wilson et. al. 2005). Full accounting of the values derived from these systems is rapidly gaining the attention of federal, state and local regulatory agencies in the United States (National Research Council 2004).

Economists have developed a widely used taxonomy of ecosystem values, although definitions of specific benefits may vary (National Research Council 2004). Typically, economists divide the total value of an environmental asset into use values and non-use values. Use values involve either in situ contact with the environmental asset in question or personal consumption of products or services derived from the asset. Use values include consumptive use values, non-consumptive use values, and indirect use values (Table 3-111).

Table 3-111. Categories of Possible Economic Values Assigned to a Marine Ecosystem and Associated Species

Economic Value	Description
	Use value
Consumptive direct use value	Value derived from extractive activities
Non-consumptive direct use value	Value gained through activities such as observing a species or ecosystem

[27] Data on product types and product amounts generated in the West Coast groundfish trawl fishery are limited compared to the Alaska groundfish fishery.

Economic Value	Description
Indirect use value	Value of the ecological functions and services of a species or ecosystem that indirectly provides support and protection to people, economic activity, and property
Non-use value	
Bequest value	Value derived from the knowledge that a species or ecosystem will be preserved for future generations
Existence value	Value emanating from the satisfaction of knowing that a particular species or ecosystem survives in a natural state

Sources: Adapted from National Research Council (2004)

Consumptive, direct use values can be further subdivided into commercial value if the purpose of the extractive activity is to sell products to others or recreational value if the purpose is recreational enjoyment and no remuneration is involved. Activities that are engaged in for recreational purposes typically are not produced and traded in the private market economy, but exceptions do exist, including charter fishing and cruise activities.

Non-consumptive direct use activities derived from marine and coastal ecosystems such as tourism, diving, bird and whale watching, and appreciating the aesthetics of wild areas are also valuable to humans. These benefits may or may not be traded in markets, an example of the former being eco-tourism activities.

Considering the high productivity of the US Pacific Coast, it is certain that any significant changes or disturbances in this ecosystem would have a significant impact on human welfare. Marine and coastal ecosystems provide natural goods and services such as flood control, carbon storage; atmospheric gas regulation, particularly by the ocean's enormously productive phytoplankton; nutrient cycling; and transformation, detoxification, and sequestration of pollutants and societal wastes (NMFS 2005). The use values derived from these services are considered indirect, since they are derived from the support and protection of activities that have directly measurable values (e.g., commercial fishing, waste treatment) (National Research Council 2004). A large part of the contributions to human welfare by these ecosystem services are pure public goods (Costanza et al. 1997). In short, they accrue directly to people without passing through the market economy, and in many cases people are not even aware of them.

Non-use values, also referred to as passive-use values, do not involve personal consumption of derived products nor *in situ* contact. They are generated from people's inter-generational altruistic concerns (i.e., bequest value) or from the utility people receive from knowing that a particular asset exists or is being preserved (i.e., existence value). For example, some people may derive pleasure from the knowledge that wildlife exists in the area and would be willing to pay to preserve the structure and integrity of these biological communities even if they never directly “experience” them. Existence value may be highly sensitive to the amount of information acquired, i.e., small changes in information or knowledge about an ecosystem or associated species may produce large shifts in existence value for that ecosystem or species. It follows, therefore, that improvements in communication technology may lead to significant increases in existence value. Given the rich biodiversity of the Pacific as well as the highly-publicized human-induced stress on this marine ecosystem, it is probable that a significant component of the overall benefit of the Pacific may be from existence (non-use) value.

Economists have taken the decomposition of the basic components of value in a species or ecosystem a step further by incorporating uncertainty into an individual's choice. For example, individuals may be willing to pay a premium for retaining an option for future use of a good or service, although they may not currently use it. This so-called 'option value' exists under conditions of uncertainty about the future demand for an environmental asset. An extension of option value known as quasi-option value represents the value derived from postponing a decision about preserving a species or ecosystem in order to gain more knowledge in the future. Less intuitive goods and services derived from marine ecosystems have been recognized only as knowledge of these ecosystems has evolved (National Research Council 2004). Some of these include maintenance of biodiversity, and contributing to biogeochemical cycles and global climate. In addition, new information about medicine, genetics, or other areas of scientific research may result from future study of marine ecosystems and associated species.

In general, the value of an ecosystem good or service will vary with its level of provision (National Research Council 2004). For example, one might feel that access to certain marine ecosystem services, such as fisheries production, has decreased over time as a result of human pressures on natural habitat. Peoples' marginal valuations of these services will increase as their perceived scarcity becomes greater.

3.15.1 Condition Indicators for General Public

A comprehensive economic evaluation exercise would seek to quantify all the benefits of potentially affected marine ecosystems and associated species. On the one hand, the benefits of activities that produce goods and services exchanged in markets are relatively easy to estimate, as the goods and services generated have 'observable' prices. Examples include the seafood produced in the commercial fisheries discussed in this analysis. On the other hand, many of the goods and services derived from marine ecosystems are not exchanged through markets and therefore do not receive market prices. These are referred to by economists as "non-market" goods and services. Examples include recreational fishing experiences as well as less intuitive benefits of ecosystems such as climate regulation and nutrient storage and cycling.

The values of many non-market ecosystem goods and services can be estimated only with stated-preference methods such as contingent valuation, and this is the application in which these methods have been soundly criticized on conceptual and empirical grounds (National Research Council 2004). Moreover, the difficulty of valuing changes in these goods or services is compounded by the underlying complexity of natural ecosystems, which creates a barrier to quantifying the links from ecosystem structure and functions to the goods and services that humans value (National Research Council 2004).

In short, complete estimation of the monetary value of the full range of benefits that marine ecosystems and associated species provide to humans is a challenging task requiring data and models not available and not practicable to develop based on the current state of understanding of these systems. In particular, directly measuring individuals' non-consumptive and non-use values for potentially affected marine ecosystems is beyond the scope of this analysis. Therefore, the direction and degree of change of selected indicators defined in other sections of the analysis are considered as proxy metrics for the non-consumptive and non-use benefits that the general public derives from potentially affected marine ecosystems. In general, it is assumed that positive changes in the status of marine ecosystem and associated species positively affect the flow of non-consumptive and non-use benefits. The proxy metrics for historical and baseline non-consumptive and non-use values include but are not necessarily limited to the following:

- Amount of groundfish bycatch (i.e., the waste associated with fish that are caught and discarded)

- Condition of overfished groundfish species
- Condition of potentially affected marine mammals, seabirds, other protected species, habitat, and predator-prey relationships

3.16 Management agencies

3.16.1 Potentially Affected Management Agencies

Under the Magnuson-Stevens Act, NMFS manages the groundfish fishery in the EEZ. The states retain jurisdiction to manage fisheries in state waters. A state can also regulate vessels registered under the laws of that state in federal waters if the state's laws and regulations are consistent with the FMP and applicable federal law.

In practice, the states and federal government manage the groundfish fishery consistently and cooperatively. For the groundfish fishery, the states, the responsible federal agencies, and the Pacific Fishery Management Council coordinate closely. Each state has a representative of its fishery agency as a voting member on the Council. NMFS has a voting member on the Council, and the US Coast Guard, US Fish and Wildlife Service, and the Pacific States Marine Fisheries Commission have non-voting members on the Council. The states and NMFS also have representatives on the Council Committees that help develop management measures.

Management and enforcement responsibilities include the following: 1) data collection, research, and analysis to prepare stock assessments, 2) the annual groundfish specifications process through which catch caps are established, 3) the ongoing Council and NMFS process of amending FMPs and regulations to implement fishery management measures, 4) monitoring of fishing activities to estimate the total catch of each species and to ensure compliance with fishery laws and regulations, 5) action to adjust management regulations to keep catch within specified caps, and 6) actions taken by NOAA Office of Law Enforcement, the US Coast Guard (USCG), and NOAA General Counsel NW to identify, educate, and in some cases, penalize people who violate the laws and regulations governing the groundfish fisheries

Agencies that have roles in the management of West Coast groundfish stocks are:

- Pacific Fisheries Management Council
- NOAA Fisheries NW Regional Office
- NOAA Fisheries SW Regional Office
- NOAA Office of Law Enforcement
- NOAA General Counsel NW
- Pacific States Marine Fishery Commission
- State of California
- State of Oregon
- State of Washington
- US Coast Guard

3.16.2 Condition Indicators for Management Agencies

Managing fisheries in a cost-effective manner while balancing risks to the resource with socioeconomic benefits is often the objective of public agencies charged with fishery management and enforcement. Therefore, management costs, enforcement feasibility, risk to resources, and reliability of fishery data are the criteria or indicators used in evaluating the historical and baseline conditions of management agencies (Table 3-112):

Table 3-112. Indicators of Historical and Baseline Conditions of Management Agencies

Criteria	Description
Management costs	Costs associated with initial issuance, appeals, quota tracking, and catch monitoring.
Enforcement feasibility	Additional resources required to implement the alternatives.
Reliability of fishery data	Magnitude of modifications to the data collection and management system needed to make the program operational.
Risk to the resources	Integrity of the management and enforcement system is sufficient to ensure that catch quotas and time/area closures are adhered to.

3.16.3 Data

Agency records, as well as, various federal and state reports will be used in the analysis of the effects of the alternatives under consideration. Staff of the NMFS will also be a source of information.

3.16.4 Past and Present Conditions of Management Agencies

The format below for describing historical and baseline conditions will be repeated for all potentially affected management agencies.

3.16.4.1 Pacific Fisheries Management Council

The Pacific Coast Groundfish Fishery Management Plan was approved by the US Secretary of Commerce on January 4, 1982 and implemented on October 5, 1982. The Plan establishes a framework authorizing the range and types of measures that may be used to manage groundfish fisheries, enumerates eighteen objectives that management measures must satisfy, and describes more specific criteria for determining the level of harvest that will provide the greatest overall benefit to the nation. Fisheries subject to management measures include limited entry trawl fisheries, limited entry fixed gear (pot and longline) fisheries, and a variety of other fisheries catching groundfish, either as target species or as incidental catch.

The Council process for setting groundfish harvest levels and other specifications depends on periodic assessment of the status of groundfish stocks, rebuilding analyses of those stocks that are overfished and managed under rebuilding constraints, and reports from an established assessment review body or a Stock Assessment Review Panel (STAR). As appropriate, the SSC recommends the best available science for groundfish management decision making. The Council's Scientific and Statistical

Committee (SSC) reviews new assessments, rebuilding analyses, and STAR Panel reports. It then recommends the data and analyses that should be used to set groundfish harvest levels and other specifications for the following biennial management period.

Prior to implementation of the FMP, management of domestic groundfish fisheries was under the jurisdiction of the states of Washington, Oregon and California. Management and lack of uniformity became difficult problems that stimulated the formation of the Pacific States Marine Fishery Commission (PSMFC) in 1947. PSMFC had no regulatory power but acted as a coordinating entity with authority to submit specific recommendations to states for their adoption. The 1977 Fishery Conservation and Management Act (later amended and renamed the Magnuson-Stevens Fishery Conservation and Management Act or Magnuson-Stevens Act (MSA)) established eight regional fishery management Councils, including the Pacific Council. Between 1977 and the implementation of the FMP, state agencies worked with the Council to address conservation issues. In 1981, managers proposed a rebuilding program for Pacific Ocean perch.

Management of foreign fishing operations began in February 1967, when the US and USS.R. signed the first bilateral fishery agreement affecting trawl fisheries off Washington, Oregon and California. Later bilateral agreements were signed with Japan and Poland. These agreements were negotiated to reduce the impact of foreign fishing on important West Coast stocks, primarily rockfish, Pacific whiting and sablefish.

Joint-venture fishing, where domestic vessels catch the fish to be processed aboard foreign vessels, began in 1979, with Pacific whiting the primary target species. By 1989, this activity entirely supplanted directed foreign fishing. Joint-venture fisheries in turn were supplanted by wholly domestic operations shortly thereafter.

Since it was first implemented in 1982, the Council has amended the groundfish FMP numerous times in response to changes in the fishery and reauthorizations of the MSA.

The current groundfish management program relies heavily on trip limits to control fishing effort, with maintaining commercial production over the year a major goal. Usage of the term "trip limit" has evolved over the past 20 years. It referred initially to the amount of fish a commercial vessel could catch and retain on a single fishing trip. Over time, it was modified to include trip frequency limits and ultimately the amount of groundfish that could be caught and retained during a specified period of time, typically one or two months. A critical feature of status quo trip limits is that they do not directly limit the amount of catch, but rather only the amount of groundfish that can be retained and delivered for sale. Commercial vessels are allowed to discard unusable fish and any fish in excess of a specified limit.

3.16.4.2 NOAA Fisheries NW Regional Office

3.16.4.3 NOAA Fisheries SW Regional Office

3.16.4.4 NOAA Fisheries Enforcement

3.16.4.5 NOAA General Counsel

3.16.4.6 Pacific States Marine Fishery Commission

3.16.4.7 State of California

3.16.4.8 State of Oregon

3.16.4.9 State of Washington

3.16.4.10 US Coast Guard

3.17 Groundfish Resources

3.17.1 Potentially Affected Groundfish Resources

Groundfish fisheries regulated under the Groundfish FMP occur on the continental shelf and upper slope off Washington, Oregon and California (Figure 3-17). The continental shelf is narrow, varying in width from less than a mile off the Monterey Peninsula in California to as much as 37 miles over Heceta Bank off southern Oregon. The total shelf area (0 to 100 fathoms) is about 30,000 square miles. By comparison, the area of the central and eastern Bering Sea shelf is an order of magnitude larger, extending approximately 200 miles from shore. The relatively limited continental shelf and upper slope habitat off the West Coast recently produced average groundfish yields of 268,085 mt within the US EEZ in comparison to recent average groundfish yields in the Eastern Bering Sea and Aleutian Islands of 1,775,600 mt within the US EEZ (NMFS 1999). Nevertheless, productivity in West Coast waters is high and groundfish resources in the region sustain major fisheries.

Figure 3-17. Geographic Distribution of Rockfish and Allied Species (Lingcod, Cabezon, Kelp Greenling, and California Scorpionfish)

Source: 2005-2006 Groundfish Spec's EIS, Appendix A, p. A-88

There are over 80 species of groundfish managed under the Groundfish FMP. Over 60 species of rockfish, 7 roundfish species, 12 flatfish species, assorted sharks, skates and a few miscellaneous bottom-dwelling marine fish species. Fish managed under the groundfish FMP, as well as, their distribution are listed in Table 3-113. Management of these groundfish species is based on principles contained in the MSA, Groundfish FMP, and MSA National Standards Guidelines.

Table 3-113. Latitudinal and Depth Distributions of Groundfish Species (Adults) Managed under the Pacific Coast Groundfish Fishery Management Plan

Common name	Scientific name	Latitudinal Distribution		Depth Distribution (fm)	
		Overall	Highest Density	Overall	Highest Density
Rockfish Species					
Roundfish Species					
Shark and Skate Species					
Other Species					

Source: PFMC, 2004, Appendix A, p. A-78

The commercial trawl fishery is prosecuted over a wide range of depths, from 20 fathoms for English sole and sanddabs to as deep as 700 fathoms for Dover sole and sablefish. Fishing also may occur on smooth mud/sand substrates, rocky reefs, pinnacles and canyons.

Mandates incorporated in the MSA as a result of passage of the SFA in1996 included abundance-based standards for declaring a stock overfished. These standards were subsequently incorporated in the Groundfish FMP with adoption of Amendments 11 and 12. The abundance-based reference points for managing West Coast groundfish species are relative to an estimate of “virgin” or unexploited biomass of the stock, which is denoted as B_0 and is defined as the average equilibrium abundance of a stock’s spawning biomass before it is affected by fishing-related mortality. The MSA and NSG employ the Maximum Sustainable Yield (MSY) concept to frame management objectives. MSY represents a theoretical maximum surplus production from a population of constant size. The NSG define it as, “the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.” Thus, for a given population, and set of ecological conditions, there is a biomass that produces MSY (denoted as B_{MSY}), which is less than the equilibrium size in the absence of fishing (B_0). The harvest rate used to specify harvest levels designed to achieve or sustain B_{MSY} is referred to as the Maximum Fishing Mortality Threshold (MFMT, denoted as F_{MSY}). There are two harvest specification reference points defined in the Groundfish FMP, a total catch OY and an ABC. The OY is typically the management target and is usually less than the ABC, based on precautionary adjustments or the need to rebuild stocks to B_{MSY}. The ABC, which is the maximum allowable harvest, is calculated by applying an estimated or proxy F_{MSY} harvest rate to the estimated abundance of the exploitable stock.

The Council-specified proxy MSY abundance for most West Coast groundfish species is 40% of B_0 (denoted as B_{40}). The Council-specified threshold for declaring a stock overfished is when the stock’s spawning biomass declines to less than 25% of B_0 (denoted as B_{25}). The MSA and NSG refer to this threshold as the Minimum Stock Size Threshold or MSST. A rebuilding plan that specifies how total fishing-related mortality is constrained to achieve an MSY abundance level, within the legally allowed time, is required by the MSA and Groundfish FMP when a stock is declared overfished.

Stocks estimated to be above the overfishing threshold, yet below an abundance level that supports MSY, are considered to be in the “precautionary zone.” The Council has specified a precautionary reduction in harvest rates for such stocks to increase abundance to B_{40}. The methodology for determining this precautionary reduction is described in the Groundfish FMP and is referred to as the 40-10 adjustment (Figure 3-18). As the stock declines below B_{40}, the total catch, OY, is reduced from the ABC until, at 10% of B_0, the OY is set to zero. However, in practice the 40-10 adjustment only applies to stocks above B_{25} (MSST) because once a stock falls below this level, an adopted rebuilding plan replaces it. Most stocks with an estimated abundance greater than B_{40} are managed by setting harvest to the ABC. The California Department of Fish and Game (CDFG) uses a precautionary policy analogous to the Council's 40-10 adjustment specified in their nearshore FMP. Called the 60-20 adjustment, the precautionary reduction of OY from the ABC would begin at 60% of $B_{0,}$ until, at 20% of B_0, the OY is set to zero.

Figure 3-18. 40-10 Rule

Source: PFMC, 2004, Appendix A, p. A-78

A significant number of stocks managed under the Groundfish FMP have never been assessed. Stocks assessed over the last 12 years, 1994 through 2005, are listed in Table 3-114. The fishery in 2002 and 2003 was characterized by significant under harvest of available catch (including discards) for many species (Table 3-115 and Table 3-116).

Table 3-114. Stock Assessments Based on Publication in the SAFE, 1994-2005

Species	Year First Assessed	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005

Source: PFMC, 2004, Appendix A, p.A-39, Table 1-1

Table 3-115. Estimated Total Catch Mortality of Selected Groundfish Species from West Coast Commercial, Tribal and Recreational Fisheries (mt), 2002

	Landings and Mortality			Targets		Discards
Species	Estimated Total Catch	Est. commercial fishery discard mort.	Actual Landings	Total Catch ABC	Total catch OY	

Source: Groundfish Trawl Individual Quota Analytical Team October 2004 Report, Appendix 6, p. H-48

Table 3-116. Estimated Total Catch Mortality of Selected Groundfish Species from West Coast Commercial, Tribal and Recreational Fisheries (mt), 2003

	Landings and Mortality			Targets		Discards
Species	Estimated Total Catch	Est. commercial fishery discard mort.	Actual Landings	Total Catch ABC	Total catch OY	

Source: Groundfish Trawl Individual Quota Analytical Team October 2004 Report , Appendix 6, p.H-49

Table 3-117. Existing Management tools, Management Tools Adopted under the Programmatic Bycatch EIS and Management Tools that would Remain in Place under an IFQ Program

Existing Management Tools (Status Quo	IFQ

Source: Groundfish Trawl Individual Quota Analytical Team October 2004 Report, Appendix 6, p.H-49

3.17.2 Condition Indicators for Groundfish Resources

Indicators of the historical and baseline conditions of groundfish species in terms of fishery impacts include but are not necessarily limited to the following:

- Fishery Mortality: The rate at which the stock is depleted by direct mortality imposed by removing the fish from the sea.
- Change in Biomass Level: The change over time in the biomass of the stock, as measured in metric tons (mt). Two measures are used: total biomass, which is the estimated biomass of the entire stock, and spawning biomass, which is the estimated biomass of all of the spawning females in the stock.
- Spatial/Temporal Concentration of Catch: The degree to which the fishery will concentrate in a particular geographic area during a particular period of time each season. This pattern in space and time can affect fishing mortality and can also influence habitat suitability for spawning, rearing, and feeding.
- Habitat Suitability: The degree to which habitat has the right characteristics to support the target stock at one or more life-history stages (spawning, rearing of juveniles, availability of food at all stages, availability of refuge area to allow escape from predators at all stages). Habitat suitability can be affected directly, for example by mechanical damage from bottom trawling, or influenced indirectly, for example, by the gradual depletion of corals that provide hard substrate.
- Prey Availability: The extent to which prey species are present in the environment and available as food to the target stock. Like habitat suitability, this measure can be affected directly, for example, by the direct removal of prey species by the fishery, or indirectly, for example, by a change in the structure of the food web.

3.17.3 Data

Detailed information on the species discussed below can be found in the Life History Appendix to the Groundfish FMP, regarding utilization patterns, fisheries that harvest the species, geographic range, migration and movements, reproduction, growth and development, and trophic interactions. Useful information also is contained in the groundfish fishery specification EIS, West Coast Groundfish Bycatch Management Program EIS (Bycatch EIS) and Groundfish Essential Fish Habitat EIS (EFH EIS).

3.17.4 Past and Present Conditions of Overfished Groundfish Species

3.17.4.1 Bocaccio (Sebastes paucispinis)

The format below for describing historical and baseline conditions will be repeated for all Overfished Groundfish Species and Non-Overfished Groundfish Species.

3.17.4.1.1 Life History and Distribution

Bocaccio (*Sebastes paucispinis*) is a rockfish species that ranges from Krozoff and Kodiak Islands in the Gulf of Alaska to central Baja California, Mexico. Historically, they have been abundant in water off central and southern California. There are two separate West Coast populations. The southern stock exists south of Cape Mendocino and the northern stock north of 48 degrees N latitude in northern Washington (off Cape Flattery). It is unclear whether this stock separation implies stock structure. Juveniles settle in nearshore waters after a pelagic stage that lasts several months. Adults are most commonly found at 100-150 m over the outer continental shelf. Bocaccio is found in a wide variety of habitats, often on or near bottom features, but sometimes over muddy bottoms.

Bocaccios are ovoviviparous. Spawning takes place during the entire year.

Maximum age of bocaccio has been radiometrically determined to be at least 40 and perhaps more than 50 years old. They are difficult to age and length measurements serve as a proxy in stock assessments.

3.17.4.1.2 Population Trends

Bocaccio was declared overfished by the Council in the fall of 1999. Catch restrictions were implemented in 2000 to initiate rebuilding. In 2004, a rebuilding plan was enacted as part of Amendment 16-3 to the Groundfish FMP. In response to the 2002 assessment, which indicated very low productivity, the 2003 OY was set at 20 mt, and the retained catch was about 12 mt. Including mortality of estimated discards, estimated 2003 total kill was 22 mt. Based on the 2003 assessment, which showed a much more productive stock, the 2004 OY was set at 250 mt, however, management used an operational target of 199 mt. The final catch was 78 mt. Discards brought the estimated 2004 kill to 83 mt.

3.17.4.1.3 Trophic Interactions

Larval bocaccios eat diatoms, dinoflagellates, tintinnids, and cladocerans. Copepods and euphausiids of all life stages are common prey for juveniles. Adults eat small fishes associated with kelp beds, including other species of rockfishes and occasionally small amounts of shellfish. Bocaccios are eaten by sharks, salmon, other rockfishes, lingcod, Albacore, sea lions, porpoises, and whales. Adult bocaccios are often caught with chilipepper rockfish and have been observed schooling with speckled, vermilion, widow, and yellowtail rockfish. They compete with chilipepper, widow rockfish, yellowtail rockfish and shortbelly rockfishes for both food and habitat resources.

3.17.4.1.4 Management Overview

Assessment scientists and managers have treated West Coast bocaccio as two separate independent stocks north and south of Cape Mendocino. Bocaccios have been an important component of California rockfish fisheries. Catches increased to high levels in the 1970s and early 1980s due to relatively strong recruitment. The Council began implementing increasingly restrictive regulations after an assessment of the southern stock in 1990 indicated that fishing rates were too high. Subsequent assessments have indicated that the stock was in severe decline, and NMFS declared the stock overfished in 1999. MacCall *et al*. (1999) estimated spawning output of the southern stock to be 2.1% of its unfished biomass and 5.1% of the MSY level. The northern stock of bocaccio has not been assessed.

3.17.4.1.5 Past and Present Effects and Management Actions

The following direct and indirect effects were identified as potentially having population-level effects:

3.17.4.1.5.1 Mortality Due to Catch/Bycatch

Catches of this species have declined steeply from the 1970s, reflecting both a long-term decline in abundance and progressive harvest restrictions. The value of catch data since 2000 is imprecise because of management-induced discarding. Recent discards in the trawl fishery have been monitored. Because of the lack of data, discard rates in other commercial fisheries are assumed to be similar to those for the trawl fishery. Discards in the recreational fishery are provided by RecFIN. Catch, both retained and discarded by fishery for years 2000 through 2004 are reported in Table 3-118.

Table 3-118. Retained and Discarded Catch of Bocaccio by Fishery, 2000- 2004 (mt)

YEAR	TRAWL	HOOK & LINE	SETNET	RecSouth	RecNorth	TOTAL

Source: MacCall, Alec D., Status of Bocaccio off California in 2005, Table ES2, p. 3.

Based on the 1996 stock assessment bocaccio was declared formally overfished, thereby requiring development of a rebuilding plan. Rebuilding was initiated through catch restrictions beginning in 2000. The rebuilding OY was set at 100mt for 2000-2002. In response to the 2002 assessment that indicated very low productivity, the 2003 OY was set at 20mt. During the same year the retained catch was 12mt. Including mortality estimated discards, the estimated total kill was 22mt. Based on the 2003 assessment, that revealed a more productive stock, the 2004 OY was set at 250mt. However, management set the operational catch target at 199mt. The final catch was 78mt. Discards brought the estimated 2004 catch to 83mt. In 2004, a formal rebuilding plan was implemented for bocaccio by the Council.

3.17.4.1.5.2 Change in Reproductive Success Due to Removal of Predators, Cannibalism, Spatial/Temporal Concentration of Fishery Catch/Bycatch, Fishery Selectivity of Juveniles

The strong 1999 year class remains dominant. However, the 2003 year class appears stronger than average (Table 3-119). Little is known about factors that affect reproductive success.

Table 3-119. Stock Status Information for Bocaccio Taken from the 2005 Stock Assessment (mt)

Year	Spawning Output (billion eggs)	Relative Abundance	Total Age-1 Biomass(mt)	Recruits at Age-1	Catch(mt)	Exploitation Rate
1995	751	5.6%	4994	755	777	15.6%
……	……..	……	…….	……..	…….	…….
2004	1261	9.4%	8078	1342	83	1.0%
2005	1440	10.7%	8561	885		

Source: MacCall, Alec D., Status of Bocaccio off California in 2005, Table 5, p. 13.

3.17.4.1.5.3 Change in Prey Availability Due to Fishery Catch/Bycatch of Prey Species

Little is known about ecological relationships between bocaccio and other organisms. Larval bocaccios eat diatoms, dinoflagellates, tintinnids, and cladocerans. Copepods and euphausiids of all life stages are common prey for juveniles. Adults eat small fishes associated with kelp beds, including other species of rockfishes and occasionally small amounts of shellfish. They compete with chilipepper, widow rockfish, yellowtail rockfish and shortbelly rockfishes for both food and habitat resources.

3.17.4.1.5.4 Change in Important Habitat Due to Fishery Gear Impacts

Bocaccios are most abundant in waters off central and southern California. Juveniles settle in nearshore waters after a several month pelagic stage. Adults are found at depths of 6.5-261 fm (12-478 m). Most adults are caught off the middle and lower shelf at depths between 27 fm and 137 fm (50 and 250 m). Larger fish tend to be deeper. Bocaccio is found in a wide variety of habitats, often on or near bottom features but sometimes over muddy bottoms. While usually found near the bottom they also have occurred as much as 16.4 fm (30 m) off bottom.

In November 1999, in order to keep trawlers from capturing canary rockfish, bocaccio, cowcod, and lingcod that associate with high relief rocky habitat on the continental shelf, the Council adopted a gear restriction that limits large footrope size. Differential trip limits were assigned to the three categories of trawl gear configurations: large footropes greater than 8 inches (20.5 cm), small footropes less than or equal to eight inches ($\leq$ 20.5 cm), and midwater or pelagic gear. This rule prohibited vessels from delivering nearshore and shelf rockfish species and many flatfish species if they use footropes with rollers larger than eight inches. Large footropes could still be used for deepwater shelf and slope species. Though only preliminary research has been done, it widely is believed that this gear restriction has been effective in keeping boats from being able to fish in high relief habitat.

3.17.4.1.6 Comparative Baseline

Based on the 2005 assessment, the estimated unfished spawning output is 13325 billion eggs (compared with 13387 billion eggs estimated in the 2003 rebuilding analysis), based on the average recruitment from spawning years between 1950 and 1985. Estimated B_{MSY} is 5330 billion eggs (compared with 5355 billon eggs in 2003). According to the 2005 assessment, the current (2005) spawning output is 1419 billion eggs, which is 27% of the estimated B_{MSY}.

Results of stock projections suggest that the stock will be in the state of rebuilding when the TIQ program is implemented. Catch projections provided by both the stock assessment author and the STAR Panel are given in the Table 3-120.

Table 3-120. Projected Abundance of Bocaccio

YEAR	STAR Panel Catch Projections (mt)		Assessment Projections	
	Minimum	Maximum	Catch (mt)	Spawning Output
2005	150	150	281	1430
2010	129	359	327	1711
2012	158	425	423	1962
2015	211	535	511	2594

* Projected abundance at an exploitation rate of 0.0498
Sources: PFMC (2005b) and MacCall (2005, p. 5).

3.17.4.2 Cowcod (*S. levis*)

3.17.4.3 Canary Rockfish (*S. pinniger*)

3.17.4.4 Darkblotched rockfish (*S. crameri*)

3.17.4.5 Pacific Ocean Perch (*S. alutus*)

3.17.4.6 Widow Rockfish (*S. entomelas*)

3.17.4.7 Yelloweye Rockfish (*S. ruberrimus*)

3.17.5 Past and Present Conditions of Non-Overfished Groundfish Species

3.17.5.1 Cabezon (Scorpaenichthys marmoratus)

3.17.5.2 Chilipepper (*S. goodei*)

3.17.5.3 Lingcod (Ophiodon elongates)

3.17.5.4 Pacific Cod (Gadus macrocephalus)

3.17.5.5 Pacific Whiting (Merluccius productus)

3.17.5.6 Shortbelly Rockfish (*S. jordani*)

3.17.5.7 Yellowtail Rockfish (*S. flavidus*)

3.17.5.8 Splitnose Rockfish (*S. diploproa*)

3.17.5.9 Slope Rockfish Complex

3.17.5.9.1 Aurora rockfish (*Sebastes aurora*)

3.17.5.9.2 Bank (Sebastes rufus)

3.17.5.9.3 Blackgill (S. melanostomus)

3.17.5.9.4 Redbanded (Sebastes babcocki)

3.17.5.9.5 Sharpchin (*S.zacentrus*)

3.17.5.9.6 Shortraker (Sebastes borealis)

3.17.5.9.7 Yellowmouth (*Sebastes reedi*)

3.17.5.10 Arrowtooth Flounder (*Atheresthes stomias*)

3.17.5.11 Petrale Sole (Eopsetta jordani)

3.17.5.12 English Sole (Parophrys vetulus)

3.17.5.13 Other Flatfish Complex

3.17.5.13.1 Butter sole (Isopsetta isolepis)

3.17.5.13.2 Curlfin sole (Pleuronichthya decurrens)

3.17.5.13.3 Flathead sole (Hippoglossoides elassodon)

3.17.5.13.4 Pacific sanddab (Citharichthys sordidus)

3.17.5.13.5 Rex sole (Glyptocephalus zachirus)

3.17.5.13.6 Rock sole (Lepidopsetta bilineata)

3.17.5.13.7 Sand sole (Psettichthys melanostictus)

3.17.5.13.8 Starry flounder (Platichthys stellatus)

3.17.5.14 DTS Complex

3.17.5.14.1 Dover sole (Microstomus pacificus)

3.17.5.14.2 Shortspine thornyhead (Sebastolobus alascanus)

3.17.5.14.3 Longspine thornyhead (Sebastolobus altivelis)

3.17.5.14.4 Sablefish (Anoplopoma fimbria)

3.17.5.15 Spiny dogfish (Squalus acanthias)

3.17.5.16 Big Skate (Raja binoculata)

3.17.5.17 Leopard Shark (Triakis semifasciata)

3.18 Other Fish Resources

3.18.1 Potentially Affected Other Fish Resources

Other affected resources, non-groundfish species, and fisheries that target them often need to be considered in groundfish management for two reasons. First, they may be caught incidentally in fisheries targeting groundfish. Therefore, management measures that change total fishing effort in groundfish fisheries could increase or decrease fishing mortality on incidentally caught species. Second, those fisheries targeting non-groundfish species may be affected by management measures intended to reduce or eliminate incidental catches of overfished groundfish species in these fisheries.

Following an approach used in the Council's Groundfish Bycatch EIS, species listed below (excluding protected species described in other sections) are examined to capture the impacts of the alternatives under consideration. The species are: California halibut, Pacific halibut, pink shrimp, spot prawn, ridgeback prawn, Dungeness crab, jack mackerel, Pacific mackerel, walleye pollock, common thresher shark, and eulachon. These species were selected because they represent the range of impacts likely to be experienced by a broader range of species, but with similar life histories, distributions, and vulnerabilities to bycatch impacts.

3.18.2 Condition Indicators for Other Fish Resources

Indicators of the historical and baseline conditions of Other Fish Resources are similar to those listed for groundfish species in Section 3.17.2.

3.18.3 Data

Information needed to complete the profiles for the selected species can be found in the groundfish fishery specification, Bycatch and EFH EISs.

3.18.4 Past and Present Conditions of Other Affected Fish Resources

The format below for describing historical and baseline conditions will be repeated for all Other Affected Fish Resources.

3.18.4.1 Pacific halibut (*Hippoglossus stenolepis*)

3.18.4.1.1 Life History and Distribution

Pacific halibut is a large flatfish which inhabits the continental shelf of the US and Canada. They are demersal and are caught most often between 90 to 900 feet. Halibut from California through the Bering Sea are considered to form one homogenous population. Halibut off the West Coast are at the extreme southern end of their range. The majority of the stock and all major spawning grounds are in more northern waters off Canada and Alaska. The halibut that inhabit West Coast waters result from the southerly migration of juveniles.

Halibut spawn during the winter in deep water (approximately 1,000 feet). Their eggs and larvae rise and drift with ocean currents in a counter-clockwise direction around the northeast Pacific Ocean. Young fish settle to the bottom in shallow feeding areas. Juvenile migration is usually completed by the age of six. Adult fish tend to remain on the same grounds year after year, making only a seasonal migration from the more shallow feeding grounds in summer to deeper spawning grounds in the winter.

Pacific halibut are the largest of all flatfish, weighing up to about 500 pounds. Females typically grow faster and live longer than males. The oldest halibut on record was 55 years old. Most are less than 25 years old.

3.18.4.1.2 Population Trends

The assessment of the Pacific halibut stock status was revised in 1996 due to the observed changes in individual growth rates that affected fishing gear selectivity. The new analyses showed that the exploitable portion of the stock apparently peaked at 326,520 mt in 1988 (Sullivan and Parma 1998). The population has since declined slightly and has maintained a biomass in the range of 270,000 to 277,000 mt. The long-term average yield was estimated at 26,980 mt (Parma 1998).

Until 2001, the exploitable biomass off the West Coast was estimated as a proportion of the total for the two areas. As a result of a reanalysis and reevaluation of assessment methods for these areas in 2001, the biomass off the West Coast was estimated from survey data and a separate assessment of abundance in British Columbia. This change resulted in about a 5% increase in the biomass estimate for the West Coast (Clark and Hare 2001).

3.18.4.1.3 Trophic Interactions

Halibut are carnivorous. Larval halibut feed on plankton. When they are one to three years old they feed on small crustaceans and small fish. As halibut grow, fish become a larger part of their diet. They prey upon cod, sablefish, pollock, rockfish, sculpins, turbot, and other flatfish. They also leave the bottom to feed on sand lance and herring in the water column. Octopus, crabs, clams, and occasionally small halibut are also eaten. Large juveniles and adult halibut occasionally are eaten by marine mammals but are rarely prey for other fish.

3.18.4.1.4 Management Overview

Pacific halibut are managed by the bilateral (US/Canada) International Pacific Halibut Commission (IPHC). Implementing regulations are set by each country in their own waters. The Pacific Halibut Catch Sharing Plan for waters off Washington, Oregon and California (Area 2A) specifies management measures for the West Coast. Implementing catch levels and regulations are the responsibility of the Council, the states of Washington, Oregon, and California, and the Pacific halibut treaty tribes. A license from the IPHC is required to participate in the commercial fishery. The commercial sector in Area 2A is confined to waters south of Point Chehalis, Washington. In the non-treaty commercial sector, 85% of the harvest is allocated to the directed halibut fishery and 15% to the salmon troll fishery to cover incidental catch. When the Area 2A total allowable catch is above 900,000 pounds, halibut may be retained in the limited entry sablefish fishery north of Point Chehalis.

3.18.4.1.5 Past and Present Effects and Management Actions

The following direct and indirect effects are capable of having population-level effects on Pacific halibut:

3.18.4.1.5.1 Mortality due to Bycatch

Pacific halibut bycatch mortality in groundfish fisheries was relatively low until the 1960s when it increased due to the development of foreign fisheries. Total bycatch mortality for IPHC regulatory areas:

- Peaked in 1965 at approximately 21 million pounds
- Decreased in the late 1960s to approximately 15 million pounds
- Increased to approximately 20 million pounds by the early 1970s
- Decreased through the late 1970s with an increase to approximately 18 million pounds in 1980.

The bycatch of Pacific halibut in groundfish fisheries decreases the amount that can be taken by fishermen in the directed IPHC fishery. Pacific halibut bycatch data for the limited entry trawl fishery are presented in Table 3-121.

Table 3-121. Bycatch of Pacific Halibut taken by Limited Entry Trawl Vessels, 2000-2005

Year	2000	2001	2002	2003	2004	2005
Bycatch (mt)						

Source:

3.18.4.1.5.2 Spawning Disruption

The early directed Pacific halibut fishery took place year-round. Fish caught during spawning season were of poor quality. Bycatch contains both adult (>81 cm) and juvenile fish (<81 cm). A winter season fishery closure was proposed as a result of the 1913 US and Canada discussions on international halibut management. This closure was proposed in order to eliminate a period of fishing when poor quality fish were caught.

Pacific halibut spawn in very deep water (400 to 600m) off the continental shelf edge and negative effects would arise to the degree that fisheries utilize these areas.

3.18.4.1.5.3 Reduced Recruitment: Spatial/Temporal Concentration of Bycatch

Alaska groundfish fisheries take the majority (more than 90%) of Pacific halibut bycatch. Juveniles may or may not have completed their migration from the nursery ground to home areas. Their capture has the potential effect of reducing recruitment to adult stock in the home area where they would have migrated. Adult fish caught as bycatch have completed their migration back to home areas. Therefore, bycatch of adult fish can be expected to affect only the stock in the area where the bycatch is taken. Approximately 50 to 60 percent of the bycatch is below the directed fishery size limit of 81 cm.

3.18.4.1.6 Comparative Baseline

The assessment of the Pacific halibut stock status was revised in 1996 due to observed changes in individual growth rates that affected fishing selectivity. Pacific halibut have shown a decrease in size and age over time. Fish today weigh approximately a third of what fish of the same size weighed 20 years ago. The new analyses indicated that the exploitable portion of the stock apparently peaked at 326,520 mt in 1988. The population has since declined slightly and has maintained a biomass in the range of 270,000 to 277,000 mt. The long-term average yield was estimated at 26,980 mt round weight (Parma 1998).

The nature of the Pacific halibut commercial fishery has changed in recent years. Both Canadian and US fisheries have gone from open access with short season fisheries to IFQ fisheries that last eight months. In addition, quota allocations have been implemented for Native American treaty, commercial, and recreational fisheries for waters from Washington to California. Removals of Pacific halibut for 2002 totaled 44,453 mt (net weight). The breakdown by fishery is: commercial catch 33,749 mt (76%); sport catch 3,946 mt (9%); incidental bycatch mortality, 5,806 mt (13%): personal use, 363mt (1%); and waste, 726 mt (2%).

Currently, the Pacific halibut resource is considered to be healthy. The 2005 estimated total exploitable biomass was 395 million pounds (Clark and Hare, 2005). The total exploitable biomass is predicted to be 382 million pounds in 2006. It is inferred that any direct or indirect effects of past bycatch in groundfish fisheries were taken into account under the IPHC management process.

3.18.4.2 California halibut (Paralichthys californicus)

3.18.4.3 Pink shrimp (Pandalus jordani)

3.18.4.4 Spot prawn (Pandalus platyceros)

3.18.4.5 Ridgeback prawn (*Sicyonia ingentis*)

3.18.4.6 Dungeness crab (*Cancer magister)*

3.18.4.7 Jack mackerel (Trachurus symmetricus)

3.18.4.8 Pacific mackerel (*Scomber japonicus*)

3.18.4.9 Walleye pollock (Theragra chalcogramma)

3.18.4.10 Common thresher shark (*Alopias vulpinus*)

3.18.4.11 Eulachon (thaleichthys pacificus)

3.19 Marine Mammals

3.19.1 Potentially Affected Marine Mammals

The waters off Washington, Oregon and California support a wide variety of marine mammals. Approximately 30 species, including seals and sea lions, sea otters, whales, dolphins, and porpoise, occur within the EEZ. Many marine mammal species seasonally migrate through West Coast waters, while others are year-round residents

The 2005-2006 groundfish fishery specification EIS (PFMC, 2004) reported marine mammal fishery interactions observed during the first year of the West Coast Groundfish Observer Program. Information obtained indicated that lethal interactions occurred in both the trawl and longline fisheries, although the highest mortality was seven California sea lions taken by trawl gear. Trawlers also took two Steller sea lions and an unidentified sea lion. Because marine mammals are diving animals and strong swimmers, they are more likely to be taken in trawl gear than longline gear. Other marine mammals noted to have been taken in West Coast groundfish fisheries are the harbor seal, sea otter, Dall's porpoise, white-sided dolphin, and short-beaked dolphin.

Table 3-122. Interactions between Marine Mammals and West Coast Groundfish Trawl Fishery Documented by West Coast Groundfish Observers between September 2001 and October 2002

Species	Gear Type	Type of Interaction
California Sea Lion	Trawl	7 Individuals Taken
Unidentified Sea Lion	Trawl	1 Individual Taken
Steller sea Lion	Trawl	2 Individuals Taken
California Sea Lion	Trawl and Longline	Feeding on Discard
Steller sea Lion	Trawl and Longline	Feeding on Discard
Pacific white-sided Dolphin	Trawl	Feeding on Discard

Source: PFMC, 2004, p.225. Note – Approximately 10% of the coast-wide limited entry trawl landed weight was observed.

3.19.2 Condition Indicators for Marine Mammals

Indicators of the historical and baseline conditions of marine mammals in terms of fishery impacts include but are not necessarily limited to incidental takes/entanglement, prey availability, spatial and temporal distribution of the fishery catch, and disturbance by fishing vessels.

Fisheries interact with marine mammals either operationally or biologically. Operational effects are direct and occur in the form of incidental takes that may result in disturbance, serious injury or mortality. Operational interactions between marine mammals and fisheries result from entanglement in actively fishing or derelict fishing gear. Marine mammals become entangled when they encounter derelict or active fishing gear. Biological interactions result from disturbance of normal marine mammal foraging behavior.

Some types of fisheries are much more likely to catch marine mammals incidentally than others. Incidental take is a direct source of mortality and NMFS requires all commercial fisheries in the US EEZ to report the incidental take and injury of marine mammals that occur during their operation. Provisions of the MMPA requires that all commercial fisheries be placed into one of three categories, based on the frequency of incidental take (serious injuries and mortalities) relative to the value of potential biological removal (PBR) for each stock or marine mammal. Category 1 fisheries are those fisheries with frequent incidental take, defined as those with takes greater than or equal to 50% of PBR for a particular stock. Category II designates fisheries with occasional serious injuries and mortalities, defined as those with takes between 1% and 50% of PBR. Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities, defined as those with takes less than or equal to 1% of PBR.

In some cases, individual marine mammals may be killed outright by fishing activity. In other cases, individuals are affected in ways that may decrease their chances of surviving natural phenomenon or reproducing successfully. These sub-lethal impacts reduce the overall "fitness" of individuals and may have population-level implications if enough animals are impacted. Although some fisheries have no record of incidental take of marine mammals, some may contribute to the effect of entanglement in lost fishing gear. Evidence of entanglement comes from observations of animals trailing ropes, buoys, nets, or bearing scars from such gear. Sometimes stranded marine mammals also have evidence of entanglement but it may not be possible to ascertain whether the entanglement caused the injury or whether the corpse picked up gear as it floated around after death. Sometimes an animal is observed to become entangled in specific fishing gear, in which case an incidental take or minor injury may be recorded for the particular fishery, but many times the contributions of individual fisheries to the overall effects of entanglement are difficult to document and quantify.

Prey availability to marine mammals depends on a large number of factors and differs by species and season. Among these factors are oceanographic processes such as upwelling, thermal stratification, fronts, gyres, and tidal currents that concentrate prey at particular times and places. Prey availability also depends on the abundance of competing predators and the ecology of prey species, including their natural rates of reproduction, seasonal migration, and movements within the water column. The relative contributions of factors that influence prey availability for particular species and areas are rarely known. Most critical is the lack of information on how events outside an animal's foraging range or in a different season may influence the availability of prey to animals in a particular place and time.

The question of whether commercial fisheries have an effect on the availability of prey to marine mammals may be addressed by examining the degree of direct competition (harvest) for prey and by looking for potential indirect or cascading effects of fisheries on the food web of the mammals. For marine mammals whose diets overlap to some extent with the target or bycatch species of the fisheries, fishery removals could potentially decrease the density of prey fields or cause changes in the distribution of prey such that foraging success of the marine mammals is affected. If alternative prey is not available or is of poorer nutritional quality than the preferred species, or if the animal must spend more time and energy searching for prey, reproductive success and/or survival can be compromised. In the case of marine mammals that do not feed on fish or feed on different species than are taken in the fisheries, the removal of a large numbers of target fish from the ecosystem may alter the predator/prey dynamics and thus the abundance of another species that are eaten by marine mammals. The mechanisms and causal pathways for many potential food web effects are not well documented because they are difficult to study.

The effects of disturbance caused by vessel traffic, fishing operations, engine noise, and sonar pulses on marine mammals are largely unknown. Observed behavior ranges from attraction to the vessel, to course modification or maintenance of distance from the vessel. Dall's porpoise, Pacific white-sided dolphins, and beaked whales have been observed adjacent to vessels for extended periods of time. A small number of fatal collisions with various vessels have been recorded in California and Alaska in the past decade.

3.19.3 Data

Information useful to this analysis is available in various agency reports, and the PFMC's Bycatch and EFH EISs.

3.19.4 Past and Present Effects on Marine Mammals

3.19.4.1 Pinnipeds

The format below for describing historical and baseline conditions will be repeated for all potentially affected marine mammal species.

3.19.4.1.1 Northern elephant seal (*Mirounga angustirostris*)

3.19.4.1.1.1 Life History and Distribution

Elephant seals (*Mirounga angustirostris)* range throughout the northeast Pacific Ocean from central Baja California, Mexico to the GOA and eastern Aleutian Islands, with occasional sightings in the southern Bering Sea. They are polygamous breeders with males forming harems and defending them against other mature males. Breeding occurs on islands from central Baja California north through central Oregon. Pupping and mating occurs on isolated islands and mainland rookeries during January and February. Following the breeding season, adults go to sea and forge until they return to rookery islands to molt in April (females) and July (males). Following the molt adults again return to foraging areas, where they feed until returning for the following breeding season. Elephant seals complete two long distance migrations each year, with males traveling further then females.

3.19.4.1.1.2 Population Trends

The existing population of northern elephant seals is descended from perhaps 100 animals that survived in Mexico after the species was nearly exterminated by commercial hunting in the 19th century. The population has expanded rapidly since hunting was halted. An estimated population of 127,000 animals existed in US and Mexico waters in 1991, with 95,000 animals present in the US Approximately 101,000 animals were estimated to make up the US population in 2001.

3.19.4.1.1.3 Trophic Interactions

Northern elephant seals feed mainly at night in very deep water and consume whiting, skates, rays, sharks cephalopods, shrimp, euphausiids, and pelagic red crab. Males forage in areas close to or over the continental shelf break, during intense feeding. Females tend to forage in deeper waters off the continental shelf. In these waters, elephant seals dive to depths of 400m, apparently feeding on organisms associated with the deep scattering layer. Some adult and sub-adult males occupy more coastal habitats where dive records suggest feeding on or near the bottom. While the proportion of the population using coastal habitats is unknown, most adult males and females appear to feed in the water column over very deep water.

3.19.4.1.1.4 Management Overview

Management of the northern elephant seal is the responsibility of NMFS. Since they are protected under the MMPA, a moratorium exists on the taking of all marine mammals, except for subsistence use by Alaska Natives. Northern elephant seals are not an important species for Alaska Native subsistence hunters. Because their annual human-caused mortality is less than the calculated PRB for this stock, they are not considered a "strategic" stock under the MMPA.

3.19.4.1.1.5 Past and Present Effects and Management Actions

Directed Mortality from Incidental Take by West Coast Groundfish Fisheries

There are no recent estimated incidental kills of Northern elephant seals in groundfish fisheries along Washington, Oregon and California. However, they have been caught in setnet fisheries. On average 86 elephant seals are taken each year in various gillnet fisheries from California to Washington (Carretta et al. 2002).

3.19.4.1.1.6 Comparative Baseline

The population of northern elephant seals in US waters continues to expand and is currently over 100,000 animals. They spend part of the year in Alaska waters, but there is little information on their diet there. Incidental take in groundfish fisheries appears to be a very rare occurrence.

3.19.4.1.2 Northern fur seal (Callorhinus ursinus)

3.19.4.1.2.1 Life History and Distribution

The northern fur seal ranges throughout the North Pacific Ocean from southern California north to the Bering Sea and west to the Okhotsk Sea and Honshu Island, Japan. The species is sexually dimorphic, meaning that mature males and females look very different. They have a highly polygamous mating system, breeding in dense colonies on islands located near highly productive marine areas. Breeding is restricted to only a few sites: the Pribilof Islands, Commander Islands, Bogoslof Island, and San Miguel Island. Most females, pups, and juveniles leave the Bering Sea by late November and are pelagic in the North Pacific during the late fall and winter, migrating south as far as Southern California in the eastern North Pacific and Japan in the western North Pacific, until they begin returning to the rookeries in March.

Two separate stocks of northern fur seals are recognized within US waters: an eastern Pacific stock, that includes all the animals in the BSAI and GOA, and a San Miguel Island (California) stock. Population estimates for the eastern Pacific stock are calculated by estimating the number of pups at rookeries and then multiplying by an expansion factor (4.5) that approximates a life table analysis(Angliss and Lodge 2002).

3.19.4.1.2.2 Population Trends

Until the mid-1970s, northern fur seal population trends could be explained by commercial harvest patterns in the North Pacific Ocean. Large population declines coincided with large harvests of female and juvenile fur seals. The fur seal population has shown a resiliency to sustained harvest of adult males when females and juveniles were not harvested. The history of pelagic sealing (1875-1909), its impact on the fur seal population, and a subsequent treaty banning pelagic sealing is found in Gentry (1998). At the peak of pelagic sealing (1891-1900), more than 42,000 animals were taken annually in the Bering Sea. Because the takes were greatly reducing the stock, Great Britain (for Canada), Japan, Russia and the United States ratified the Treaty for the Preservation and Protection of Fur Seals and Sea Otters in 1911. With the signing of the treaty, commercial pelagic harvests ended. The population grew rapidly after the cessation of pelagic sealing until the mid-1940s.

The Alaska population of fur seals peaked at a high of approximately 2 million animals during the 1950s. In 1957, the signatories to the 1911 Treaty ratified a new agreement. During those negotiations, calculations presented by the US suggested that maximum sustained productivity would occur at lower female population levels than those that existed in the early 1950s. Consistent with that analysis, from 1956 to 1968, a total of about 30,000 to 96,000 juvenile males were harvested each year and a pelagic collection of about 16,000 females were taken for research purposes by the US and Canada. This harvest of females and juveniles caused a large population decline into the late 1960s.

With the cessation of female and juvenile harvests, the population increased only briefly into the mid-1970s. The population then began a steady decline of 6 to 8 percent per year into the 1980s. The cause of this decline has not been determined. By 1983 the population was estimated to be 877,000 seals (Angliss *et al*, 2001). Since 1998, population estimates from pup surveys indicate that the population is declining at a rate of more than five percent per year. The cause of the decline is unknown.

3.19.4.1.2.3 Trophic Interactions

Northern fur seals food habitats studies that were based on the frequency of occurrence indicate that the diet consisted of 67% fish, (34% Pollock, 16% capelin, 6% Pacific herring, 4% deep-sea smelt and lantern fish, 2% salmon, 2% Atka mackerel, and no more than 1% eulachon, Pacific cod, rockfish, sablefish, sculpins, Pacific sand lance, flatfish and other fish) and 33 percent squid (Perez 1990)

3.19.4.1.2.4 Management Overview

Northern fur seals are managed by NMFS and by co-management agreements with Alaska Native Organizations under Section 119 of the MMPA. Northern fur seals were listed as depleted under the MMPA in 1988 because population levels had declined to less than 50% of that observed in the late 1950s.

3.19.4.1.2.5 Past and Present Effects and Management Actions

Direct Mortality from Incidental Take by West Coast MSA Groundfish Fisheries

Incidental take of fur seals from the foreign and joint venture groundfish fisheries averaged 22 animals per year form 1978 to 1988 (Perez and Loughlin 1991). The high seas driftnet fisheries killed thousands of fur seals every year, including an estimated 5,200 fur seals in 1991, the last year before those fisheries were outlawed by United Nations Resolution (46/215) (Hill and DeMaster 1999).

Based on self-reported mortalities, State of Alaska managed salmon fisheries took an average of 15 fur seals per year from 1990 to 1998. Most of these mortalities come from the Bristol Bay salmon drift gillnet fishery.

The incidental take of northern fur seals is uncommon in groundfish fisheries. The last recorded mortality in any Alaska groundfish fishery occurred in 1996. The estimated average take in trawls is less than one seal per year (Angliss *et al*. 2001). During the period 1994-1998 there were no reported mortalities of northern fur seals in any observed fishery along the West Coast of the continental US

The contribution of MSA fisheries to gear and debris that causes entanglement of fur seals is unknown.

Indirect Effects through Changes in Prey Availability

Ecological interactions between northern fur seals and groundfish fisheries are caused by spatial and temporal overlap between fur seal foraging areas and groundfish fisheries. The diet of northern fur seals includes a wide range of fish species.

3.19.4.1.2.6 Comparative Baseline

Northern fur seals are numerous. However, they are listed as a "depleted" stock under the MMPA because of major population declines from 1950 to the late 1960s and again from the mid-1970s through the early 1980s. Subsistence hunts make up the great majority of anthropogenic mortality, but these levels are well below PBR. Incidental take in groundfish fisheries hovers around zero. There still is concern about potential competitive interactions for prey.

3.19.4.1.3 Guadalupe furl seal (*Arctocephalus townsendi*)

3.19.4.1.4 California sea lion (*Zalophus californianus*)

3.19.4.1.5 Pacific harbor seal (*Phoca vitulina richardsi*)

3.19.4.1.6 Northern or Steller sea lion *(Eumetopias jubatus)*

3.19.4.2 Sea otters

3.19.4.2.1 Southern (*Enhydra lutris nereis*)

3.19.4.2.2 Washington (*Enhydra lutris kenyoni*)

3.19.4.3 Cetaceans

3.19.4.3.1 Minke whale (*Balaenoptera acutorostrata*)

3.19.4.3.2 Short-finned pilot whale (*Globicephala macrorhynus*)

3.19.4.3.3 Gray whale (*Eschrilchtius robustus*)

3.19.4.3.4 Harbor porpoise (*Phocoena phocoena*)

3.19.4.3.5 Dall's porpoise (*Phocoenoides dalli*)

3.19.4.3.6 Short-beaked common dolphin Pacific white-sided dolphin (*Delphinus delphis*)

3.19.4.3.7 Long-beaked common dolphin (*Delphinus capensis*)

3.20 Seabirds

3.20.1 Potentially Affected Seabirds

The highly productive California Current System supports more than two million breeding seabirds and at least twice that number of migrant visitors. Over 100 species have been recorded within the EEZ, including albatross, shearwaters, petrels, storm-petrels, cormorants, pelicans, gulls, terns, and alcids (murres, murrelets, guillemots, auklets, and puffins). In addition to these seabirds, millions of other birds are seasonally abundant in this oceanic habitat including: waterfowl, waterbirds (loons and grebes), and shorebirds (phalaropes). Not surprisingly, there is considerable overlap of fishing areas and areas of high bird density in this highly productive upwelling system. The species composition and abundance of birds varies spatially and temporally. The highest seabird biomass is found over the continental shelf, and bird density is highest during the spring and fall when local breeding species and migrants predominate.

The US Fish and Wildlife Service (USFWS) is the primary federal agency responsible for seabird conservation and management. Four species found off the Pacific coast are listed under the ESA

(Short-tail albatross (*Phoebastria albatrus*), California brown pelican (*Pelecanus occidentalis*), California least tern (*Sterna artillarum browni*), and Marbled murrelet (*Brachyramphs marmoratus*)). The USFWS has classified several seabird species that occur off the Pacific Coast as "Species of Conservation Concern." These species include the black-footed albatross (*Phoebastria nigripes*), ashy storm-petrel (*Oceanodroma homochroa*), gull-billed tern (*Sterna nilotica*), elegant tern (*Sterna elegans*), arctic tern (*Sterna paradisaea*), black skimmer (*Rynchops niger*), and Xantus's murrelet (*Synthliboramphus hypoleucus*).

Under the MSA, NMFS must ensure fishery management actions comply with other laws designed to protect seabirds. NMFS also is required to consult with USFWS if fishery management plan actions may affect seabird species listed as endangered or threatened.

3.20.2 Condition Indicators for Seabirds

Indicators of the historical and baseline conditions of seabirds in terms of fishery impacts include but are not necessarily limited to incidental takes mortality from vessel strikes, changes in prey availability, ingestion of processing waste and discards, and habitat suitability.

Seabirds are caught incidentally in all types of fishing operations. Table 3-123 provides observer data for West Coast groundfish fisheries for the time period September 2001 to October 2002. The risk of seabirds getting caught in fishing gear varies with the density and behavior of bird species around the fishing vessel, the type of fishing gear used, and the technique and/or devices used, if any, to deter or avoid the birds. Many factors contribute to the abundance and distribution of birds at sea, including the availability of natural prey, but many species are attracted to fishing vessels in order to forage on bait, offal, discards, and natural prey disturbed by fishing operations.

Table 3-123 Interactions between Seabirds and West Coast Groundfish Fisheries Documented by West Coast Groundfish Observers between September 2001 and October 2002.

Species	Gear Type	Type of Interaction
Unidentified Gull(*Larus species*)	Trawl	1 Individual Taken
Unidentified Seabird	Trawl	4 Individuals Taken
Short-tailed Albatross (*Phoebastria albatrus*)	Longline and Trawl	Feeding on Discard
…	…	…

Source: PFMC Bycatch EIS Table 4.3.16, p 4-137

Although more than 100 species of seabirds occur along the West Coast, little information is available about the incidental take of seabirds in West Coast groundfish fisheries. Observers aboard groundfish vessels off the West Coast during August 2001 –October 2002 reported that four cormorants and one gull were taken by the limited entry trawl fleet.

Catcher processors and motherships participating in the Pacific whiting fishery have had full observer coverage since the mid-1970s. The non-whiting portion of the fishery has had observer coverage only since the fall of 2001. Between September 2001 and October 2002, approximately 10% of the coast wide limited entry trawl landed weight was observed.

Seabirds sometimes strike vessels and fishing gear in flight. Some birds fly away without injury but others are injured.

Seabird species differ greatly from one another in their prey requirements and feeding behavior, leading to substantial differences in their responses to changes in the environment. Diets consist largely of fish and squid less than 15 cm long and large zooplankton. Although they may take a wide variety of prey species during the year, most seabirds in a given area and time depend on one or a few prey species. Diets and foraging ranges are most restricted during the breeding season, when high-energy food must be delivered efficiently to nestlings, and are more flexible during other times of the year. Prey availability may also depend on the ecology of food species, including productivity of other predators, food-web relationships of the prey, and prey behavior, such as migration of fish and zooplankton. Many factors that influence prey availability are completely unknown. Most critical is the lack of information on how events beyond a seabirds foraging range may influence prey availability. Such factors may include environmental changes, fluctuations in region wide stocks of forage and non-forage species, and commercial harvest.

Scavenging of fishery wastes can influence seabird populations in either a negative or positive manner. If populations of large gulls increase as a result of waste and discards, local populations of other species may be reduced through increased competition for nest sites and predation pressure on young birds. Further, sudden withdrawal of discards could cause the predatory species to increase pressure on other species long before the predator populations decline. The seabird species whose normal foraging behavior includes scavenging on dead material, may be at risk of either becoming entangled or being incidentally taken in fishing gear.

Fishing vessels can affect seabird populations whether or not the vessels are engaged in fishing or processing activities. Many surface-feeding birds are attracted to vessels, while others may be displaced from foraging areas. The magnitude of the impact depends on the location, timing, and frequency of vessel traffic and on how closely those factors coincide with important foraging areas.

There is some concern that fishing activity, especially trawling, may have detrimental impacts on seabirds by disrupting the schooling behavior of their prey and therefore decreasing their foraging success. The intensity and longevity of trawling impacts on the structure and distribution of forage fish schools are not known. However, given the large number of variables that influence foraging success for different species and the ability of birds to search for prey over large distances, it is unlikely that any localized disruptions of prey fields could be demonstrated to have specific adverse effects on birds. There is evidence that some forms of trawling may make fish vulnerable to diving birds by disturbing or injuring the fish.

3.20.3 Data

Information useful to this analysis is available in various agency reports, and the PFMC's Bycatch and EFH EISs.

3.20.4 Past and Present Conditions of Seabirds

The format below for describing historical and baseline conditions will be repeated for all potentially affected seabird species.

3.20.4.1 Albatross

3.20.4.1.1 Life History and Distribution

Albatross range extensively throughout waters off the Pacific Coast. In particular, three species, the short-tailed albatross (*Phoebastria albatrus*), the black-footed albatross (*Phoebastria nigripes*), and the Laysan albatross (*Phoebastria immutabilis*) occur in the waters off Washington, Oregon, and California.

Short-tailed albatross

The short-tailed albatross is a very large seabird with narrow, seven-foot-long wings adapted for soaring low over the ocean. Young birds are chocolate brown, gradually turning white as they grow older. Adult short-tailed albatross have an entirely white back, white or pale yellow head and back of the neck, and black and white wings. Their large pink bill is hooked at the end with a blue tip. Presently, these birds nest on two islands in Japan, Torishima and Kinami-kojima. Single eggs are laid in October and November, chicks hatch in December through February, and the young fledge from May to July. Immature birds wander across the North Pacific until they begin breeding at 6 to 9 years of age.

Once considered the most common albatross ranging over the continental shelf, the short-tailed albatross was hunted to near extinction in the early 1900s. It is now thought to be one of the rarest birds in the world. Relatively little is know about seasonal movements or factors determining marine distribution of short-tailed albatross. It is believed that the species was formerly common off China, in the Sea of Japan, the Sea of Okhotsk, the Bering Sea north to the Bering Strait, and throughout the enter temperate North Pacific, from Alaska to Baja California.

Black-footed albatross

Much like the short-tailed albatross, the black-footed albatross ranges throughout the North Pacific. It is the most abundant albatross species along the Pacific Coast and is present throughout the year. Breeding occurs in the Northwestern Hawaiian Islands and Torishima Island, and the species disperses from the Bering Sea south along the West Coast to California

Laysan albatross

The Laysan albatross, also known as the “gooney bird,” is a large white and black seabird with a wingspan that reaches 85 inches. The most abundant North Pacific albatross is the Laysan albatross. The vast majority of the Laysan albatross population breeds in the Northwestern Hawaiian Islands, fewer numbers breed on the Japanese Ogasawara Islands, and fewer pairs breed on islands off Baja California, Mexico. They range, when at sea, from the Bering Sea, to California and to Japan. They are monogamous and if one of the mates should die it may be several years before the survivor can make a new pair bond. Only one egg is laid per year. Similar to the other North Pacific albatross species, Laysan albatross feed on schooling fish and squid at the ocean’s surface.

3.20.4.1.2 Population Trends

Short-tailed albatross

Historical records indicate that there were over 100,000 individuals at the Torishima Island colony at the turn of the century and during 1998 and 1999 just over 400 breeding adults were found at the colony. The population on Torishima Island is now growing at an annual rate of 7.8%. The current estimate of the short-tailed albatross world population is about 1700 individuals.

Black-footed albatross

The global black-footed albatross population is estimated at about 56,600 breeding pairs and thought to be decreasing. This species is classified as vulnerable by the IUCN (International Union for the Conservation of Nature and Natural Resources) based on a 19% population decrease during 1995 to 2000 and a projected future decline of more than 20% over the next 60 years owing to interactions with longline fisheries for tuna, billfish, and groundfish in the North Pacific.

Laysan albatross

The USFWS counts Laysan albatross at Midway Atoll once every four years and counts birds or samples density at French Frigate Shoals and Laysan Island every year. These monitoring sites account for 93% of the world population of about 393,000 breeding pairs. At these three sites breeding populations have declined at an average rate of 3.2% per year since 1992.

3.20.4.1.3 Trophic Interactions

Short-tailed albatross

Short-tailed albatross forage at the water's surface on squid, crustaceans, and various fish species. They forage along the edge of the continental shelf and on the outer shelf where upwelling brings their prey to the surface. They may forage at night, as well as, during the day. Since they range widely over the ocean and are opportunistic feeders, their diet varies with local availability. Albatross are attracted to fishery wastes released from fishing vessels and processors and are vulnerable to being caught in fishing gear, especially on baited hooks longline fisheries.

Black-footed albatross

Black-footed albatross prey on fish, sea urchins, amphipods, and squid. Foraging is done at night and prey is caught at the ocean's surface. This species will follow fishing vessels and consume discards. Besides interactions with longline gear, other threats to black-footed albatross include nest loss due to waves, pollution, introduced predators, oiling, ingestion of plastic and volcanic eruptions on Torishima Island.

Laysan albatross

Cephalopods play a major role in the diet of Laysan albatross. Squid are the most important food item, although which species are eaten is poorly known. Few observations have been published about their feeding in the wild, other than of those birds scavenging near fishing vessels. They take food in the upper meter of the ocean's surface. In addition to squid, other food items include myctophids, other invertebrates and fish. Similar to the other North Pacific albatross species, Laysan albatross feed on schooling fish and squid at the ocean's surface.

3.20.4.1.4 Management Overview

Short-tailed albatross

Management responsibility for the short-tailed albatross is under the jurisdiction of the USFWS. The short-tailed albatross was originally designated as "endangered" under the Endangered Species Conservation Act of 1969 as a foreign-listed species (because they do not nest in US territory). In 1973, when the ESA replaced the 1969 Act, the short-tailed albatross was included as a foreign species but not as a native species. This created an administrative error by listing its status as endangered elsewhere except in the US The USFWS corrected the error by extending the species' endangered status to include its range within the US The proposed and final rules contain extensive information on the species life history, demographics, and population status (USFWS 1998a and 2000c).

At the time a species is proposed for listing under the ESA, critical habitat can also be proposed. Habitats outside the US are not eligible for critical habitat designation. Because the North Pacific Ocean and Bering Sea once supported millions of short-tailed albatross, USFWS scientists believe that this species is nowhere near its habitat carrying capacity. NMFS determined that designation of critical habitat within the US would not be beneficial to the short-tailed albatross (USFWS 1998a and 2000c).

Under the requirements of the ESA, the USFWS is responsible for determining whether proposed federal actions are likely to jeopardize the recovery of the species.

Black-footed albatross

Wildlife management responsibility for the black-footed albatross falls under the jurisdiction of the USFWS. Most research on the species has taken place in their northwest Hawaiian breeding colonies. Black-footed albatross have been assigned "vulnerable" status on the World Conservation Union's Red List of Threatened Species because of reported declines in numbers on their breeding colonies.

Laysan albatross

Wildlife management responsibilities for Laysan albatross fall under the jurisdiction of the USFWS. The species is protected under the US Migratory Bird Treaty Act.

3.20.4.1.5 Past and Present Effects and Management Actions

3.20.4.1.5.1 Direct Mortality from Incidental Takes in West Coast MSA Groundfish Fisheries

Short-tail albatross

No short-tailed albatross have been recorded as being taken in the groundfish trawl fishery. Short-tail albatross have been reported to be taken by vessels using hook-and line gear. Because incidental catch is so small, estimation of the total take is problematic. Uncertainty exists on how the known take should be expanded to the unobserved portion of fisheries.

Black-footed albatross

Laysan albatross

3.20.4.1.5.2 Direct Mortality from Vessel Strikes

Short-tailed albatross

Many trawl vessels deploy a cable ("third wire") from the vessels to the trawl net monitoring device (sonar transducers). These cables are not typically monitored by groundfish observers and any birds killed by such collisions would not be likely to make their way into the trawl net and would therefore not be recorded in the observers haul sample. The distribution and extent of seabird mortalities or injuries by species is therefore unknown.

Black-footed albatross

Laysan albatross

3.20.4.1.5.3 Changes in Prey Availability

Short-tailed albatross

The impacts of groundfish and other fisheries on the availability of prey to short-tailed albatross are unknown. The ability of albatross to forage over huge areas is presumed to lessen the potential impact of localized depletion of prey. The fact that the short-tailed albatross population is growing at or near its theoretical maximum rate and the environment used to support millions of them, it is thought that food availability is not a limited at present (USFWS 2000c).

Black-footed albatross

Laysan albatross

3.20.4.1.5.4 Consumption of Fishery Discards

Short-tailed albatross

Short-tailed albatross are attracted to fishing vessels and processors to eat discards and offal. Benefits of the food source are countered by an increased risk of incidental take.

Black-footed albatross

Laysan albatross

3.20.4.1.6 Comparative Baseline

Short-tailed albatross

Short-tailed albatross were nearly exterminated by commercial hunting about 100 years ago but are making a comeback. The population appears to be increasing at a near-maximum rate. They still are one of the rarest species on earth with an estimated population of only 1600 to 1700 birds. They are listed as “endangered” under the ESA. Recent scientific research indicates that new seabird avoidance techniques can greatly reduce the incidental take of species with similar feeding behavior as short-tailed albatross.

Black-footed albatross

Black-footed albatross is the most numerous albatross species along the Pacific Coast. There were an estimated 300,000 black-footed albatross in the world as of 2001. However, their numbers have declined over the past ten years. This species is classified as “vulnerable” by the IUCN (International Union for the Conservation of Nature and Natural Resources) based on a 19% population decrease during 1995-2000 and a projected future decline of more than 20% over about the next 60 years owing to interactions with longline fisheries. The species faces serious threats from incidental take in longline fisheries throughout its range, especially by foreign tuna and swordfish pelagic longline fisheries in the Central and North Pacific.

Laysan albatross

The most abundant North Pacific albatross species is the Laysan albatross. At three main monitoring sites, Midway Atoll, French Frigate Shoals and Laysan Island, breeding populations have declined at an average rate of 3.2% per year since 1992.

3.20.4.2 California brown pelican

3.20.4.3 Northern Fulmars

3.20.4.4 Shearwaters

3.20.4.5 Cormorants

3.20.4.6 Puffins

3.21 Other Protected Resources

3.21.1 Potentially Affected Other Protected Species

Protected species fall under three overlapping categories reflecting four mandates: the Endangered Species Act of 1973 (ESA), the Marine Mammal Protection Act of 1972 (MMPA), the Migratory Bird Treaty Act (MBTA), and EO 13186. Groundfish fisheries may interact with these species, causing mortality or harming to them. Different protected species are affected by a variety of gear types. For example, ESA-listed salmon stocks are caught in mid-water trawl fisheries targeting Pacific whiting.

Several species of marine mammals, seabirds, sea turtles and salmon on the West Coast have been listed as threatened or endangered under the ESA. A species is listed as “endangered” if it is in danger of extinction throughout a significant portion of its range and “threatened” if it is likely to become an endangered species within the foreseeable future throughout all, or a significant portion, of its range. Species subject to conservation and management requirements of the ESA are identified below.

3.21.2 Condition Indicators for Other Protected Species

Indicators of the historical and baseline conditions of Other Protected Species in terms of fishery impacts include but are not necessarily limited to the following:

It is possible that the effects of management action on protected species correlate with changes in the level of fishing effort. Increased fishing effort, other things held constant, could lead to an increase in interactions between fishing vessels and protected species, while a decrease in fishing effort would have the opposite effect. Thus, changes in fishing effort could be one way to evaluate the relative effects of the alternatives. However, there are limited data available on the distribution, intensity, and duration of fishing effort associated with groundfish. If such data are available, the distribution and intensity level of fishing effort will have to be correlated with the distribution of protected species to determine effects.

In addition to the quantity of effort expended by harvesters, the spatial and temporal distribution of the catch is off interest. This interest stems from the possibility of the fishery moving into areas and taking place during times of the year that alters the characteristics of fishery/other protected resource interactions. Prey availability and habitat suitability are also considered important indicators of change.

3.21.3 Data

Information useful to this analysis is available in various agency reports, and the PFMC's Bycatch and EFH EISs.

3.21.4 Past and Present Conditions of Other Protected Resources

Since marine mammal and seabird species that are protected were discussed in their respective sections of this chapter, attention is focused on salmon and sea turtles.

3.21.4.1 Sea Turtles

Numerous human-induced factors have adversely affected sea turtle populations in the North Pacific and resulted in their threatened or endangered status. Documented incidental capture and mortality by purse seines, gillnets, trawls, longline fisheries, and other types of fishing gear adversely affect sea turtles. However, the relative effect of each of these sources of impacts on sea turtles is difficult to assess. Sea turtle species that might interact with groundfish fisheries are discussed below.

3.21.4.1.1 Leatherback Sea turtles

The format below for describing historical and baseline conditions will be repeated for all Other Protected Species.

3.21.4.1.1.1 Life History and Distribution

Leatherback turtles are the largest sea turtles in the world, reaching a shell length of 1.6 m and a mass of 700 kg. They reach sexual maturity at an estimated age of 13 to 14 years for females and live for more than 30 years. Leatherbacks must surface to breathe air, but can stay submerged for two hours and dive to 1,000 m. Males do not leave the ocean, but females come ashore on open sandy beaches to dig nests and lay eggs. Nestlings emerge from the sand at night and attempt to make their way to the sea. Very little is known about the distribution and natural history of these young turtles after they leave their natal beaches.

Leatherback turtles are widely distributed throughout the world's oceans. In the Pacific Ocean, they range as far north as Alaska and as far south as Chile and New Zealand. The Pacific Coast of Mexico is regarded as the most important breeding ground for nesting leatherback turtles in the world. No nesting is known to occur in US waters of the Pacific.

Leatherback turtles undertake long migrations and exhibit broad thermal tolerances. They have been found in waters ranging from 7 to 27 degrees C. They are typically associated with continental shelf habitats and pelagic environments.

3.21.4.1.1.2 Population Trends

Estimating the population size of this species is especially difficult because individuals are widely dispersed and males never come ashore. Population estimates are usually based on the number of females seen on nesting beaches.

3.21.4.1.1.3 Trophic Interactions

Leatherback turtles feed predominately on jellyfish and other large planktonic species. There is little information available on their diet in subarctic waters. To a large extent, the oceanic distribution may reflect the distribution and abundance of their planktonic prey. Nestling and juvenile turtles fall prey to a host of bird, mammal, and fish species throughout their range.

3.21.4.1.1.4 Management Overview

NMFS and the USFWS share responsibilities at the federal level for the research, management, and recovery of Pacific sea turtle populations under US jurisdiction. The leatherback turtle was listed as endangered under the ESA in June of 1970. NMFS and USFWS have created a joint Pacific Sea Turtle Recovery team to develop a recovery plan for the species. Under the requirements of the ESA, these agencies are responsible for issuing Section 7 consultations for federal action that may impact the species.

Leatherback turtles are classified as Critically Endangered in the *Red List of Threatened Species*, where taxa classified are considered to be "facing an extremely high risk of extinction in the wild in the immediate future." In October of 2000, the US ratified the Inter-American Convention for the Protection and Conservation of Sea Turtles. This treaty is the first international agreement dedicated solely to raising standards for the protection of sea turtles.

3.21.4.1.1.5 Past and Present Effects and Management Actions

Direct and Indirect Effects of External Fisheries

Commercial fisheries have affected leatherback turtles. The primary threats are entanglement in fishing gear (e.g. longlines, driftnets and etc.), boat collisions, and contamination by oil spills, and ingestion of marine debris. Spotila et al. (2000) indicates that a conservative estimate of annual leatherback fishery-related mortality (from longlines, trawls and gillnets) in the Pacific during the 1990s was 1,500 animals. They estimate that this represented about a 23 percent mortality rate.

Direct and Indirect Effects of Groundfish Fisheries

Little is known about the interactions between sea turtles and West Coast fisheries. Directed fishing for sea turtles in West Coast groundfish fisheries is prohibited because of their ESA listings. However, incidental takes of sea turtles by longlines and trawls can occur.

According to NMFS, there have been no direct takes of leatherbacks in the West Coast groundfish fisheries. Further, there is no fishery that is targeting the prey of this species. NMFS has concluded that the direct and indirect effects of commercial fisheries on leatherback turtles are negligible and not likely to jeopardize its survival or recovery.

3.21.4.1.1.6 Comparative Baseline

Leather back turtle populations are in serious decline around the world, largely due to many human-related sources of mortality. All of them must be addressed, if this species is to recover for the brink of extinction. However, some commercial fisheries have played a role in the decline of this species.

3.21.4.1.2 Olive Ridley sea turtle

3.21.4.1.3 Loggerhead sea turtle

3.21.4.1.4 Green sea turtle

3.21.4.2 Salmon

Chinook or king salmon (*Oncorhynchus tshawytscha*) and coho or silver salmon (*O. Kisutch*) are the main species caught in Council-managed ocean salmon fisheries. Therefore the discussion focuses on these two species

3.22 Habitat

3.22.1 Potentially Affected Habitat

Healthy marine habitat is basic to the wellbeing of marine species and their place in the food web (http://www.pcouncil.org/groundfish/gfefheis/chp3affenvi.pdf). The marine habitats of the West Coast support living marine resources at the most fundamental level by providing the conditions necessary for populations to sustain themselves. From a broad perspective, habitat is the geographic area, and the characteristics of that area, where the species occurs at any time during its life. Habitat characteristics comprise a variety of attributes and scales, including physical (geological), biological, and chemical parameters, location, and time. It is the interactions between environmental variables that make up habitat that determine a species' biological niche. These variables include both physical variables such as depth, substrate, temperature range, salinity, and dissolved oxygen, and biological variables such as the presence of competitors, predators, or facilitators.

Habitat use by species subject to trawl fisheries extends out to the deepest depth observed for groundfish, or 3400 m (EFH EIS Ch. 2 http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/NEPA-Documents/EFH-Final-EIS.cfm). As a result, the habitat resource category covers extensive areas of the Pacific coast. However, not all of this area may have the same value for groundfish or the trawl industry. We have identified two sub categories of habitat that may have interactions with the trawl industry: essential fish habitat (EFH)/habitat areas of particular concern (HAPC), and marine protected areas (MPA)/marine areas closed to trawling. Regulations restrict trawling in some portions of these habitat categories, but fishermen may access them if allowed to change gear under an IFQ system.

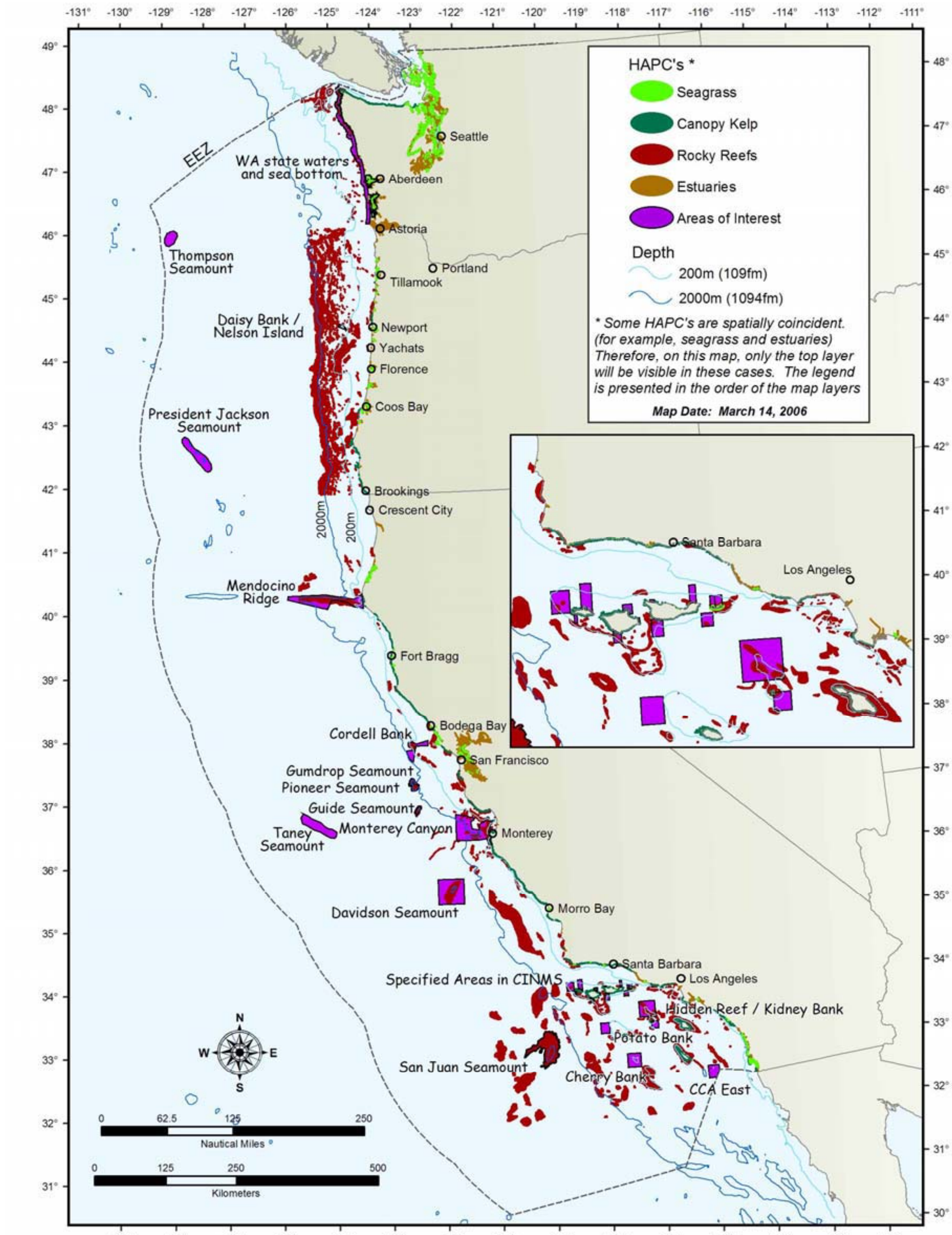
3.22.1.1 Essential Fish Habitat/Habitat Areas of Particular Concern

The MSA establishes a requirement for regional councils and NMFS to describe and identify EFH (Section 303(a)(7), Section 305(b)), and NMFS published regulations to guide Councils in this action (50 CFR part 600; subpart J). The Pacific Council and NOAA Fisheries have prepared an EIS for EFH (http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/NEPA-Documents/EFH-Final-EIS.cfm) that formed the basis of Amendment 19 that described and identified EFH for the Pacific Region (http://www.pcouncil.org/groundfish/gffmp/gfa19/A18-19Final.pdf). The decision for EFH was based on runs of a model that calculated habitat suitability for species and life stages (EFH EIS); the model calculated a habitat suitability probability (HSP) that formed the basis for various alternatives. The overall extent of groundfish EFH for all FMU species is identified as all waters and substrate within the following areas:

- Depths less than or equal to 3,500 m (1,914 fathoms) to mean higher high water level (MHHW) or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow.
- Seamounts in depths greater than 3,500 m as mapped in the EFH assessment GIS.
- Areas designated as HAPCs not already identified by the above criteria.

The following subsection describes the five HAPCs established under Amendment 19. Figure 7.2 in the final EIS for Amendment 19 provides a graphic description of the HAPCs and is reproduced here as Figure 3-19. One type of HAPC—the oil platform HAPC—was included in the amendment approved by the Council, but was not approved as part of the final amendment, and therefore is not included in the figure.

Figure 3-19. HAPCs Designated in Amendment 19



Source: This figure is reproduced from Figure 7.2 of the EIS for Amendment 19.

3.22.1.1.1 Estuaries

Estuaries are protected nearshore areas such as bays, sounds, inlets, and river mouths, influenced by ocean and freshwater. Tidal cycles and freshwater runoff varies salinity within estuaries and results in great diversity, offering freshwater, brackish and marine habitats within close proximity (Haertel and Osterberg 1967). Estuaries tend to be shallow, protected, nutrient rich, and biologically productive, providing important habitat for marine organisms, including groundfish. For many fish species, estuaries provide important habitats for reproduction, feeding, and refuge (Gunter 1957). These important ecological functions are vulnerable to damage from a wide range of human activities because estuaries receive runoff from adjacent land areas and are often close to human population centers. Anthropogenic impacts to estuaries may include nutrient loading, introduction of non-native species, changes in water temperature, increased turbidity etc.

3.22.1.1.2 Canopy Kelp

Of the habitats associated with the rocky shelf habitat composite, kelp forests are of primary importance to the ecosystem and serve as important groundfish habitat. Lush kelp forest communities (e.g., giant kelp, bull kelp, elk kelp, and feather boa kelp) are found relatively close to shore along the open coast. On the rocky shelf, these subtidal communities provide vertically-structured habitat through the water column; a canopy of tangled blades from the surface to a depth of 10 feet; a water column, stipe region and the bottom, holdfast region. The stands provide nurseries, feeding grounds and shelter to a variety of groundfish species and their prey (Ebeling, et al. 1980; Feder, et al. 1974). Giant kelp communities are highly productive relative to other habitats, including wetlands, shallow and deep sand bottoms, and rock bottom artificial reefs (Bond *et al.*, 1998). Their net primary production is an important component to the energy flow within food webs. Foster and Schiel (1985) reported that the net primary productivity of kelp beds may be the highest of any marine community. The net primary production of seaweeds in a kelp forest is available to consumers in three forms: living tissue on attached plants; drift in the form of whole plants or detached pieces; and dissolved organic matter exuded by attached and drifting plants (Foster and Schiel 1985).

3.22.1.1.3 Seagrass

Seagrass species found on the West Coast of the US include eelgrass (*Zostera spp*., *Ruppia sp*.) and surfgrass (*Phyllospadix spp*.). These grasses are vascular plants, not seaweeds, forming dense beds of leafy shoots year-round in the lower intertidal and subtidal areas. Eelgrass is found on soft-bottom substrates in intertidal and shallow subtidal areas of estuaries. Surfgrass is found on hard-bottom substrates along higher energy coasts. Studies have shown seagrass beds to be among the areas of highest primary productivity in the world (Herke and Rogers 1993; Hoss and Thayer 1993). High primary production, results in high rates of secondary production (Emmett, et al. 1991; Good 1987; Herke and Rogers 1993; Sogard and Able 1991). Seagrasses also provide habitat for many invertebrates and epiphytes and provide many crustaceans, fish, and birds with protection and food. Several commercially important species use seagrass beds including Dungeness crab (Spencer 1932) and Pacific herring (Taylor, 1964). Pacific coast seagrasses have been shown to be vulnerable to anthropogenically introduced species of seagrasses such as *Spartina alterniflora* (Taylor et al. 2004) and *Zostera japonica* (Harrison and Bigley 1982).

3.22.1.1.4 Rocky Reefs

Rocky habitats are generally categorized as either nearshore or offshore in reference to the proximity of the habitat to the coastline. Rocky habitat may be composed of bedrock, boulders, or smaller rocks such as cobble and gravel. Hard substrates are one of the least abundant benthic habitats, yet they are among the most important habitats for groundfish. Typical shallow water hard bottom fishes include rockfish (e.g. *Sebastes spp*.), lingcod, and sculpins (MMS 2002). Managed species known to use nearshore hard bottom habitat in the coastal zone include black rockfish, black-and-yellow rockfish, brown rockfish, cabezon, calico rockfish, California scorpionfish, chilipepper, copper rockfish, gopher rockfish, kelp greenling, leopard shark, lingcod, olive rockfish, quillback rockfish, redstripe rockfish, rosethorn rockfish, shortbelly rockfish, silvergray rockfish, and spotted ratfish. In the offshore area, many managed species are dependent on hard bottom habitat during some portion of their life cycle. Typically, deeper water hard bottom habitats are inhabited by large, mobile fishes such as rockfish, sablefish, Pacific hake, spotted ratfish, and spiny dogfish (MMS 2002). Cross and Allen (1993) estimated that about 30 percent of the fish species and 40 percent of the families occur over hard substrates. Fishing with certain gear types can modify rocky habitat and have a negative impact on plants and animals found there.

3.22.1.1.5 Areas of interest

Areas of interest are discrete areas that are of special interest due to their unique geological and ecological characteristics. The following areas of interest are designated HAPCs:

- Off of Washington: All waters and sea bottom in state waters shoreward from the three nautical mile boundary of the territorial sea shoreward to MHHW.
- Off of Oregon: Daisy Bank/Nelson Island, Thompson Seamount, President Jackson Seamount.
- Off of California: all seamounts, including Gumdrop Seamount, Pioneer Seamount, Guide Seamount, Taney Seamount, Davidson Seamount, and San Juan Seamount; Mendocino Ridge; Cordell Bank; Monterey Canyon; specific areas in the federal waters of the CINMS; specific areas of the Cowcod Conservation Area.

3.22.1.2 Marine Protected Areas and Areas Closed to Trawling

Marine protected area (MPA) is a broad term describing a managed area in the marine environment that provides some level of resource protection. MPAs are a management tool that may employ a range of strategies to protect the marine environment—from prohibiting the harvesting of all marine life, to allowing the take of only selected marine species, or restricting other kinds of human uses. Besides having different levels of protection and use, MPAs vary dramatically in size and shape, protect a range of natural or cultural resources, and are designated by a variety of authorities. The federal government, individual states, and jurisdictions within states may specify MPAs within their jurisdictions. The national MPA center http://mpa.gov has developed a database of MPAs (http://www.mpa.gov/inventory/inventory.html) that allow searches by jurisdiction. For purposes of this project, we will identify MPAs in federal waters, and indicate whether each MPA restricts fishing activity.

Marine areas closed to trawling are a specific type of MPA. As part of the EFH process to address adverse fishing impacts, the Pacific Council has proposed 41 potential trawl closure areas. Marine Protected Areas and areas closed to trawling or bottom contact gear may also be affected by the changes in the distribution of trawl effort. The three tables below list marine sanctuaries and other protected areas that may be affected. [28]

[28] Closed areas described in Table 3-125 and Table 3-126 were provided in a comment from Merrick Burden to the November 28 *Analytical Framework*.

Table 3-124. Marine Sanctuaries and other Protected Areas

Area Designation	Agency
Olympic Coast National Marine Sanctuary	National Oceanic and Atmospheric Administration
Monterey Bay National Marine Sanctuary	National Oceanic and Atmospheric Administration
Gulf of the Farallones National Marine Sanctuary	National Oceanic and Atmospheric Administration
Channel Islands National Marine Sanctuary	National Oceanic and Atmospheric Administration
Yelloweye Rockfish Conservation Area	NOAA – NMFS
Columbia River Salmon Conservation Zone	NOAA – NMFS
Klamath River Salmon Conservation Zone	NOAA – NMFS
Western and Eastern Cowcod Conservation Areas	NOAA – NMFS

Table 3-125. Other Areas Closed to Trawling

Washington	Oregon	California	California
Olympic_2	Nehalem Bank / Shale Pile	Eel River Canyon	Monterey Bay / Canyon
Biogenic_1	Astoria Canyon	Blunts Reef	Point Sur Deep
Biogenic_2	Siletz Deepwater	Mendocino Ridge	TNC/ED Area 2
Grays Canyon	Daisy Bank / Nelson Island	Delgada Canyon	TNC/ED Area 1
Biogenic_3	Newport Rockpile / Stonewall Bank	Tolo Bank	TNC/ED Area 3
	Heceta Bank	Point Arena Offshore	Potato Bank
	Deepwater off Coos Bay	Cordell Bank	Cherry Bank
	Bandon High Spot	Biogenic Area 12	Hidden Reef / Kidney Bank
	Rogue Canyon.	Farallon Islands / Fanny Shoal	Catalina Island
		Half Moon Bay	Cowcod Conservation Area East.

Table 3-126. Other Areas Closed to Bottom Contact Gear

Oregon	California	California	California
Thompson Seamount	Inner Cordell Bank (within 50 fm isobath)	Gull Island	Santa Barbara
President Jackson Seamount	Anacapa Island MCA	Harris Point	Scorpion
	Anacapa Island MR	Judith Rock	Skunk Point
	Carrington Point	Painted Cove	South Point.
	Footprint	Richardson Rock	Davidson Seamount

3.22.2 Condition Indicators for Habitat

Indicators of the historical and baseline conditions of habitat in terms of fishery impacts include but are not necessarily limited to the following:

- Amount of gear interactions with habitat by gear
- Location of interactions with habitat
- Habitat type affected

The conditions of habitat are not likely to be measurable by quantifiable indicators.

3.22.3 Data

The assessment consolidates the best available ecological, environmental, and fisheries information into various databases, including a geographic information system (GIS) and the habitat use database (HUD). The following types of data were used in this process to identify groundfish EFH:

- Geological substrate (GIS)
- Estuaries (GIS)
- Canopy kelp (GIS)
- Seagrass (GIS)
- Structure-forming invertebrate information
- Bathymetric data (GIS)
- Latitude (GIS)
- Information on pelagic habitat
- Data quality (GIS and other databases)
- Information on the functional relationships between fish and habitat (including a literature review consolidated in the HUD).

An expert panel developed the following six habitat categories, each with one or more habitat types:

Habitat Category	Habitat type
Nearshore biogenic	Estuarine macrophyte
	Estuarine shellfish
Nearshore unconsolidated bottom	Soft bottom
Nearshore hard bottom	Hard bottom
Offshore biogenic	Macrophyte
	Shelf shellfish
	Shelf sponge
	Slope sponge
	Shelf coral
	Slope coral
	Ridge
	Basin
	Continental rise
Offshore unconsolidated bottom	Shelf soft bottom
	Shelf canyons, gullies, and ice formed features
	Ridge
	Slope canyons, gullies, and ice formed features
	Continental rise, canyons, gullies, and landslides
Offshore hard bottom	Canyon and ice formed features
	Exposure
	Slope canyons, gullies, landslides, and exposures
	Basin

The EFH EIS describes and maps the various habitats found in the Pacific Region. A GIS database contains the geographical delineation of each parcel of habitat, over which other information may be overlain.

The EFH EIS contains the available information for the use of each habitat parcel by each life stage of the fish species addressed in the Groundfish FMP. Maps of probabilities of habitat use by species and life stages are available through the NOAA Fisheries Northwest Regional Office.

The EIS contains the available information relevant to habitat impacts of fishing activities. The EIS describes the gear types used in the Pacific region and their habitat impacts. Of the suite of gears, trawl (pelagic and non-pelagic) is the primary gear of interest as this document specifically addresses trawling. Hook and line gear, especially longline, and pot gear are also important as some alternatives may allow fishermen to change from trawling to other gears. Longline and pots are the most likely substitute gears for catching species targeted by trawling.

Statistical areas for catch reporting are too large to provide sufficient detail for attributing fishing effort to specific habitat parcels. As a trawl IFQ program could lead fishermen to change fishing locations, a mechanism to estimate the spatial distribution of fishing effort will be necessary to evaluate the impacts of redistribution of fishing effort.

3.22.4 Past and Present Conditions of Habitat

The information available for habitat is provided in the EFH EIS (http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery Management/NEPA-Documents/EFH-Final-EIS.cfm). Geographic information in the Pacific Region consists of parcels of habitat category and habitat type in the GIS database. The available information does not permit evaluation of past conditions or trends in condition. The available information describes the habitat types and their utilization by organisms, but does not assess the quality of the habitats in terms of disturbance or degradation from original condition.

3.23 Trophic Relationships

3.23.1 Potentially Affected Trophic Relationships

3.23.1.1 Predators

Groundfish species may be preyed upon by a number of different organisms depending on the life stage in question (http://www.pcouncil.org/groundfish/gfefheis/chp3affenvi.pdf). The eggs of groundfish species may be consumed by various planktivores and benthic predators (e.g. gastropods, crabs, fishes, echinoderms). Larvae and juveniles are taken by sea birds, porpoises, larger life stages of groundfish, chaetognaths, and invertebrates (e.g. siphonophores, jellyfishes). Adults of managed groundfish species are preyed upon by man, sharks, marine mammals (e.g. sea lions, seals, whales, dolphins, porpoises, and otters), halibut, albacore, salmon, and other larger predatory groundfish such as cabezon, lingcod, and sablefish. These groundfish predators either occupy the same habitats as their groundfish prey or encounter those habitats in the course of hunting over larger areas of ocean territory.

There is some concern that the biological environment has been directly affected by fishing and other marine harvesting activities that remove top-level predators. For example, several recent studies have suggested that removal of whales and other marine mammals has created cascading effects throughout marine food webs. From an ecosystem perspective, human fishing activities might be viewed as large-scale predation that consumes species at a variety of trophic levels and may also affect other trophic levels directly or indirectly. Effects of fishing on species abundance, species diversity, community structure and physical environment have been described in numerous studies. For example, top predators may be removed, resulting in increases of species lower in the food web. Fishing practices can also affect habitats, community structure and biodiversity. The cumulative effects of 100 years of West Coast groundfish fishing (and fishing for other species) have helped shape present day ecosystem structure. Forage species (including groundfish and non-groundfish) captured in the course of groundfish fishing may be removed from the environment. Top-level predator species may also be removed, resulting in increases of their prey species. Or, their competitors may increase, making it difficult to regain their previous position in the hierarchy. In either case, fishing increases the mortality rate of "unfished" populations. These and other changes could alter trophic dynamics, abundance and biodiversity of the ecosystem. It is difficult, however, to separate many of these fisheries-related changes from environmental ones. See the Life History Appendix to the FMP and the Habitat Use Database for detailed information on the known predators of each species in the groundfish FMU.

3.23.1.2 Prey

Major prey items of managed groundfish species include copepod eggs, copepod nauplii, amphipods, diatoms, dinoflagellates, tintinnids, cladocerans, fish and invertebrate eggs and larvae, mysids, ophiuroids, tunicates, worms (e.g. annelids and polychaetes), shrimp, decapod crustaceans, bivalve mollusks, squids and octopi, euphausiids, pelagic fishes (e.g. anchovies, smelt, lanternfishes, and herring), sculpins, juvenile flatfishes, juvenile rockfishes, and other small fishes (http://www.pcouncil.org/groundfish/gfefheis/chp3affenvi.pdf). These prey occupy the same habitats as the groundfish species/life stage that prey upon them. There is usually a dietary progression in groundfish coinciding with ontogeny, which generally begins with the consumption of zooplankton during early life stages and culminates with the consumption of crustaceans, bivalves, cephalopods and/or fishes in the adult life stage. The various species/life stages of groundfish take prey by a wide range of strategies including planktivory, sit and wait predation, and active predation on sedentary or mobile prey items. Some groundfish species feed throughout the diel cycle, some feed diurnally, and others are nocturnal hunters. Groundfish diets may shift in response to seasonal variations in prey abundance. Cannibalism on various life stages is known to occur in some groundfish such as the macrourids, cabezon, kelp greenling, gopher rockfish, Pacific whiting, rock and petrale sole. See the Life History Appendix to the FMP and the Habitat Use Database for detailed information on the trophic interactions of each species in the groundfish FMU.

3.23.2 Condition Indicators for Trophic Relationships

Indicators of the historical and baseline conditions of trophic relationships in terms of fishery impacts include but are not necessarily limited to the following:

- Prey abundance
- Predator abundance
- Average trophic level

The conditions of trophic relationships are not likely to be measurable by quantifiable indicators.

3.23.3 Data

Most research dealing with predator-prey relationships in the Pacific Region deals with coastal survival of salmon, and evaluating how oceanic and climate process affect primary and secondary productivity and the connection to juvenile salmon growth and survival in the California Current (e.g., http://www.nwfsc.noaa.gov/research/divisions/fed/oceanecology.cfm). Various ecosystem modeling approaches, such as Ecopath/Ecosim, have been used for these studies. These models require data on abundance and distribution of lower trophic level species, especially those important to salmon. Similar data for non-coastal-salmon appears less readily available. For example, the EIS for EFH described predators and prey for the west coast groundfish but discussed predator-prey relationships only generally. The Stock Assessment and Fishery Evaluation document for the west coast groundfish did not specifically address ecosystem issues, which would include predator-prey relationships.

3.2.2 Past and Present Condition of Trophic Relationships

A summary of information available for predator-prey interactions is provided in the EFH EIS (http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/NEPA-Documents/EFH-Final-EIS.cfm. The available information does not permit evaluation of past conditions or trends in condition. The available information describes the predators and prey of Pacific coast groundfish, but does not assess the status of the species involved in terms of disturbance or degradation from the original condition.

4 Effects of Alternatives

This section forms the scientific and analytic basis for the comparison of the effects of the No-Action and Action Alternatives on the resource and stakeholder groups of concern. The Consulting Team proposes that a "resource-based" approach be used to present the effects analysis, whereby a single section of the document describes the effects of all of the alternatives for a particular resource or stakeholder group.

The description of the effects of the alternatives is prefaced by a section that provides an overview of the analytical framework used to guide the analysis. Specifically, the analytical framework includes the following elements:

- Comparative Baseline
- Analytical Timeline
- Types of Effects Analyzed
- Analytical Scenarios
- Significance Criteria and Ratings
- Cumulative Effects Analysis
- Data Collection and Models for Estimating Impacts

4.1 Analytical Framework

4.1.1 Comparative Baseline

Chapter 3 of this document contains a comprehensive assessment of the human (physical, biological, and socioeconomic) environment potentially affected by the alternative actions under consideration. For each of the resource or stakeholder groups used to analyze the impacts of the alternatives in this document, a comparative baseline has been developed. The baseline incorporates the status of the resource or stakeholder group at a given point in time. In general, the baseline condition for this effects analysis is the status of potentially affected resource and stakeholder groups as of 2005. The baseline conditions provide a benchmark against which the specific effects of each alternative, including the No-Action Alternative, are compared.

The baseline does not necessarily represent a static 'snapshot' of the resource and stakeholder groups. To the extent feasible, trends in the data from the description of historical conditions are used to depict baseline conditions more accurately (i.e., by incorporating variation over time). The cumulative past and present effects of groundfish fishery activity, as well as effects external to the groundfish fishery such as other fishery impacts, human-induced impacts, and climatic events influencing the resource and stakeholder groups, all contribute to the state of the baseline condition.

In terms of regulations, the comparative baseline includes all existing regulations as modified by actions that the Council has approved, but which have not yet been implemented by NMFS. The following bulleted list summarizes the assumptions with respect to the regulations that are considered part of the comparative baseline:[29]

- Activity restrictions in areas that are currently defined will remain in place, as will any restrictions resulting from designation of Habitat Areas of Particular Concern (HAPCs) that were approved under Amendment 19.
- Shoreside whiting monitoring and full retention as approved in Amendment 10 will be implemented and enforced.
- Binding sector total catch limits for groundfish, especially for overfished species, will be approved and implemented.[30]
- Improvements in recreational catch statistics, particularly in California, will have been made.
- All other enforcement, monitoring, catch accounting and observer coverage levels are assumed to be equivalent to those seen in 2005.

A critical component of the comparative baseline is the assumption that will be used for the ABC and OY levels for groundfish. Two options exist:

- Use the ABCs and OYs from 2005 and 2006
- Use the ABCs and OYs that will be in effect for 2007 and 2008.

The preliminary 2007/2008 OYs are likely to result in lower landings levels than were seen in 2005 primarily because the OY for sablefish is lower and perhaps more importantly the OY for yelloweye (a constraining overfished species) are also lower. Therefore the use of 2007/2008 may not be consistent with the amount of effort that was actually seen in 2005. For this reason, a decision has been made to use the 2005/2006 OYs for this EIS.

4.1.2 Analytical Timeline

In an EIS, as in any analysis that tries to predict the effects of future actions, it is critical to examine the time periods covered by the available historic and current data, the period in which the analysis will occur, and the period over which the analysts must make projections. In general, there is a significant time lag between the period during which the analysis is undertaken and the period in which the effects of a proposed action will occur. Specifically, Stage 2 of the trawl IFQ program analysis, in which the actual analysis takes place, is scheduled to begin in July 2006 and be completed in June 2007. The effects of the action won't begin to occur until 2010, and most likely will not be fully realized until some years later. The purpose of this section is to provide the Council with an understanding of the timing issues that complicate the trawl IFQ program EIS and to propose an analytical approach that can overcome the potential problems.

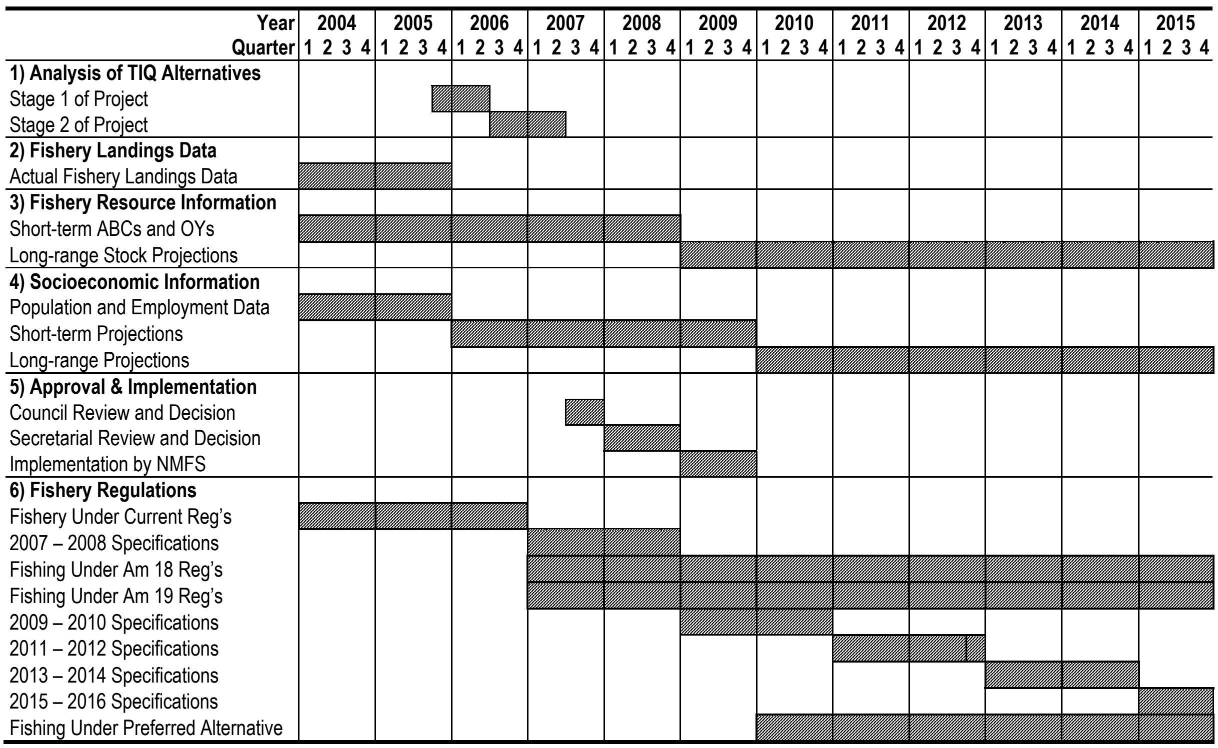
Figure 4-1 provides an overview of the trawl IFQ program analytical and implementation timeline from the perspective of Stage 2 of the trawl IFQ program analysis. The timeline (shown in the columns) is described in quarters and years from 2004 through 2015. The figure is divided into sections of rows that address the sequential elements of the timeline. The first section of the figure, labeled "Analysis of TIQ Alternatives," shows the time frame over which this analysis of the trawl IFQ

[29] This list was developed through discussions between the Consulting Team and staff members from PFMC and NMFS

[30] While groundfish sector allocations were approved in concept in Amendment 18, specific sector allocations have not yet been approved by the Council. Nonetheless PFMC and NMFS staff members believe that sector allocations should be considered part of the comparative baseline.

program takes place. Sections 2 through 4 of the figure show the information availability timeframe for key sets of data that will be necessary for the analysis. Section 5 (Approval & Implementation) shows the timeframe for the Council and Secretarial decision process and implementation of the approved program by NMFS. Finally, the last section of the figure (Fishery Regulations) shows the timing of regulatory changes that are projected to occur between now and the first years of fishing under the program developing from the preferred alternative.

Figure 4-1. Trawl IFQ Program Analytical and Implementation Timeline



Note: Historical data exists for the fishery and for resource and stakeholder groups. The fact that the timeline begins at 2004 is not meant to imply that data from earlier period will not be accessed and used.

As seen in the first section of Figure 4-1, Stage 1 of the analysis (development of the analytical framework and outline) runs approximately one year, from the 4th quarter of 2005 into the 2nd quarter of 2006. The second stage of the trawl IFQ program analysis is currently scheduled to begin in the 3rd quarter of 2006 and run through the 2nd quarter of 2007. It should be reiterated that the figure examines data and information availability from the perspective of the Stage 2 analysis—at least some of the data and information will only be available after Stage 1 is underway or completed.

Section 2 of the figure shows the period over which actual fishery landings data will be available. By the time the Stage 2 analysis is underway, fishery data for 2005 should be available. Information for earlier years will also be available and used to describe historical conditions of potentially affected resource and stakeholder groups, but it is not shown in the figure.

The figure's third section describes the availability of stock assessment information. Under the current management regime, the groundfish stock specifications cover two-year periods and are released in the 2nd or 3rd quarter each even-numbered year. Therefore, in the 3rd quarter of 2006—the beginning of the Stage 2 analysis—the specifications containing Acceptable Biological Catch (ABC) and Optimum Yield (OY) projections for 2007 and 2008 should be available. The specifications are based on periodic Stock Assessment and Fishery Evaluations (SAFE) documents that provide not only an indication of the stock levels and OYs for the near term, but generally also provide longer range projections. As indicated in the figure, these long-range projections of stock sizes are likely to be generally available through at least 2015 for most species.

The fourth section of the figure deals with available socioeconomic information, including two critical data sets, population and employment. In general, population and employment estimates through 2005 will be available at either the community level or the county level by the time Stage 2 of the EIS development is underway. Reasonably reliable projections of the population and employment through 2009 should also be available or can be generated, but projections out beyond 2009 are likely to become increasingly less certain, primarily because population estimates are recalibrated every 10 years to the decennial US census.

Assuming that the analysis of the trawl IFQ program proceeds as currently scheduled, the Council should receive a preliminary DEIS at the end of the 2nd quarter in 2007, and is presumed to make its final recommendations by the end of that year. Following the Council decision, it is presumed that development of a DEIS for Secretarial review will be required. Drafting of plan amendment language, implementation plans, proposed changes to the regulation, and the secretarial review and decision process will require at least a full year (2008) to conclude. Assuming the Secretary of Commerce approves the program, it is anticipated that implementation of the program by NMFS will require an additional year (2009), meaning that fishing under the preferred alternative from the TIQ Program would not realistically begin until 2010.

The sixth and final section of the figure shows the major regulatory regimes under which the fishery will operate between 2004 and 2015. The current regulations are expected to remain in effect through 2006. By then it is anticipated that new groundfish stock and harvest specifications would be in place, and that any regulations developed under Amendments 18 and 19 will have been implemented. It is presumed that fishing would continue under those regulations through 2009. In 2010 it is anticipated that fishing under the Preferred Alternative from the TIQ program would begin and that those regulations would largely replace existing Amendment 18 regulations.

It is also presumed that there will be a period of transition as vessel and processor owners determine how best to prosecute the fisheries under the new management regime. The duration of this transition period is uncertain—it will depend in large part on the configuration of the alternatives, the status of the stocks, and the relative profitability of the fishery. To accommodate this uncertainty, the Consulting Team recommends that the time horizon of the effects analysis be extended to at least 2015—six years after the first fishing is expected to occur under the new regime.

4.1.3 Types of Effects Analyzed

This analysis considers the terms "effects" and "impacts" to be synonymous, and the terms are used interchangeably. The Council on Environment Quality (CEQ) regulations implementing NEPA state that effects or impacts include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect or cumulative. CEQ NEPA regulations define direct, indirect or cumulative effects on the human environment as follows:

Direct Effects—are caused by the action and occur at the same time and place.

Indirect Effects—are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Cumulative Effects—are the impacts on the environment which result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

According to CEQ NEPA regulations, effects may include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

This EIS utilized a Stakeholder/Resource based approach for describing the effects of the alternatives. In this approach a single section of the document describes the effects of all of the alternatives for a particular resource or stakeholder group. For example in effects analysis for the limited-entry trawl groundfish catcher vessels, there are separate sub-sections for each alternative. Within the assessment of each alternative there will be a subsection that describes the direct and indirect effects. This will subsection will be followed by an assessment of the cumulative effects.

4.1.4 Analytical Scenarios

Given the complexity of the affected environment in which the West Coast groundfish trawl fishery occurs, current conditions of some resource and stakeholder groups are uncertain, and future conditions are always uncertain. To account for this inherent uncertainty, the Consulting Team recommends that a set of "what if" scenarios be developed and included in the effects analysis. The scenarios would be developed as a means to demonstrate differences in the way the various alternatives perform under conditions that are plausible, but that are not necessarily predicted to occur. In some cases, the scenarios might be deemed highly unlikely, but nonetheless may be considered because they create an analytical vehicle to isolate important effects of the proposed alternatives. It should be emphasized that the list of scenarios is not fixed—scenarios could be added or removed as deemed appropriate.

4.1.4.1 Possible Scenarios for Analyzing All of the Alternatives

Projected OYs and ABCs for 2007 and 2008

This analytical scenario shows how the management regimes under the No-Action Alternative and Action Alternatives can affect the behavioral responses of harvesters and processors in the event of Acceptable Biological Catch (ABC) and Optimum Yield (OY) projections for 2007 and 2008.

High Abundance of Groundfish Species

This analytical scenario shows how the management regimes under the No-Action Alternative and Action Alternatives can affect the behavioral responses of harvesters and processors in the event of higher OYs than those likely under baseline conditions.

Low Abundance of Groundfish Species

This analytical scenario shows how the management regimes under the No-Action Alternative and Action Alternatives can affect the behavioral responses of harvesters and processors in the event of lower OYs than those likely under baseline conditions.

A Stock that is Currently Not Overfished Falls into Overfished Status

An analysis of this scenario would reflect differences in the way the alternative management regime and the vessels and processors operating under that regime would respond to imposition of additional incidental catch constraints that would be necessary to rebuild a newly designated overfished stock.

A Stock that is Currently in an Overfished Status is Rebuilt

Under this scenario it is assumed that a species that has been in an overfished status is rebuilt, and that OYs return to levels that may allow targeted harvesting of the species. The likely responses of vessels and processors under the No-Action Alternative and Action Alternatives would be assessed and the difference in impacts discussed.

Alternative Sector Allocations

Scenarios could be added to both the No-Action Alternative and Action Alternatives to show the direct effects of different sector allocations of key groundfish species.

4.1.4.2 Possible Scenarios for Analyzing the No-Action Alternative

Depending on the specification, it may be important to create analytical scenarios for the No-Action Alternative. The following scenarios assume that 100 percent observer coverage is not part of the regulations included under the No-Action Alternative.

Alternative Levels of Observer Coverage on Trawl Vessels

Scenarios could be added to the No-Action Alternative to demonstrate the impacts of increasing levels of observer coverage under the existing management regime.

Alternative Requirements for the Reporting of Bycatch for Trawl Vessels

This scenario could be added to the No-Action Alternative to demonstrate potential impacts of total catch reporting under the existing management regime.

4.1.4.3 Possible Scenarios for Analyzing the Action Alternatives

In general, the proposed alternative management regimes create the potential for two basic types of efficiency gains—individual vessel owners may become more efficient in the way they harvest during the year, and the fleet as a whole may consolidate so that fewer vessels are operating. Analytical scenarios can be used to demonstrate the potential impacts of those changes. Scenarios may also be included that vary the length of the transition period to a consolidated fleet. The scenarios that could be added include the following:

No Transfers of IFQs Occur

If it is assumed for analytical purposes that no transfers occur, it is possible to estimate the potential efficiency gains that can be achieved simply by providing vessel owners the ability to optimize their harvest strategy for the amount of quota they receive.

Moderate Fleet Consolidation

In this scenario it is assumed that IFQs are transferred and vessels drop out of the fishery such that the average vessel remaining in the industry fishes an average of 100 days per year. For this scenario, the average number of fishing days per vessel per year was chosen somewhat arbitrarily, and could be adjusted based on input from the Council and NMFS.

Considerable Fleet Consolidation

In this scenario it is assumed that IFQs are transferred and vessels drop out of the fishery such that the average vessel remaining in the industry fishes an average of 200 days per year. This scenario was chosen based on the assumption that a single vessel is unlikely to be able to fish more than 300 days in a given year.

Quick Transition to a Moderately Consolidated Fleet

In this scenario it is assumed that the fleet undergoes a “moderate” consolidation during the first year of the IFQ program—the average vessel fishes 100 days per year. Theoretically, overall efficiency of the fleet—once it is consolidated—would not be affected by how quickly or gradually it consolidates. However, the impacts on communities and fishing crews are likely to be much more noticeable if the transition to a consolidated fleet is relatively quick.

Gradual Transition to a Moderately Consolidated Fleet

In this scenario is assumed that the fleet undergoes a "moderate" consolidation over the first five years of the IFQ program —the average vessel fishes 100 days per year

4.1.5 Cumulative Effects Analysis

As described in Section 4.1.3, cumulative impacts are those **combined effects** on the condition of the resource and stakeholder groups of concern that result from the incremental impact of each alternative when added to other past, present, and reasonably foreseeable future actions. For a description of the effects of past and present actions, the cumulative effects analysis draws on the historical and baseline conditions of affected resource and stakeholders presented in Chapter 3. Reasonably foreseeable future actions (RFFAs) that have the potential to affect the resource and stakeholder groups of concern were developed by the Consulting Team in consultation with Council staff and NMFS representatives.

RFFAs may be endogenous (external) or exogenous (internal) to the federal fishery management regime. Examples of endogenous RFFAs include changes in ABCs and OYs. Other endogenous RFFAs might include the reauthorization of the MSA with proposed changes to national standards, or a declaration that a particular stock has been rebuilt. Examples of exogenous RFFAs include higher than anticipated population growth in coastal communities, or a declaration of critical habitat for an endangered seabird.

The Consulting Team proposes that the end of 2015 be used as the "end point" for the cumulative effects analysis in terms of identifying RFFAs. Exact specification of the end-point for the cumulative effects analysis is a point of discussion, but the Consulting Team believes the time horizon of the analysis should be more than a few years after implementation of an alternative management regime, thereby including fleet consolidation and other possible effects.

The following initial list of exogenous RFFAs is proposed for inclusion in the cumulative effects analysis:

- Human population increases in affected communities
- Increased tourism and recreational opportunities in affected coastal communities
- Increased demand for retirement destinations in affected coastal communities
- Increased demand for protein
- Continued growth and scope of the aquaculture industry
- Increased public awareness and scrutiny of the fishing industry
- Increased demand for ecosystem-wide fishery management approaches

The Consulting Team, in consultation with Council staff and NMFS representatives, developed the following initial list of endogenous RFFAs:

- The Magnuson-Stevens Act will be reauthorized, which will result in additional regulatory requirements. The specific management changes to be included as RFFAs will be determined in discussions with Agency staff.

- Limited entry will be imposed on all fisheries currently managed under open access, including the fisheries for highly migratory species, coastal pelagic species, and salmon and portions of the groundfish fishery.
- The Monterey Bay trawl buyback program as proposed under the EFH EIS will be completed.
- Technological improvements will make it feasible to require VMS on all fishing vessels regardless of size.
- Real-time reporting of electronic fish tickets and electronic logbook entries will be required.
- Vessel Monitoring Systems (VMS) for all licensed and all open access vessels will be in place, enforced, and monitored.
- Observer coverage will be increased to levels such that 25 percent of all groundfish catches by species are observed.
- POP, darkblotched rockfish, and widow rockfish stocks will be declared rebuilt and will be removed from "overfished" status.
- Annual OYs for lingcod, POP, darkblotched rockfish, and widow rockfish will allow for limited targeting of these species.

4.1.6 Significance Criteria and Ratings

The effects analysis includes a set of criteria for identifying significant effects on the resource and stakeholder groups of concern. These criteria or thresholds are set as specific numerical standards, qualitative standards, and/or desired management goals. The criteria for defining significance are discussed in the individual effects analysis sections.

Following the analysis of effects and determination of significance, the following impact ratings are applied:

Significantly adverse (S-): Significant adverse effect based on ample information and data and the professional judgment of the analysts who addressed the topic.

Conditionally significant adverse (CS-): This determination is lacking in quantitative data or information; however, the professional judgment of the analysts is that the alternative will cause a decline in the condition of the resource.

Not significant (NS): This determination is based on information and data, along with the professional judgment of the analysts that suggest that the effects will not cause a significant change in the condition of the resource.

Conditionally significant beneficial (CS+): This determination is lacking in quantitative data and information; however, the professional judgment of the analysts is that the alternative will cause an improvement in the condition of the resource.

Significantly beneficial (S+): Significant beneficial effect based on ample information and data and the professional judgment of the analysts who addressed the topic.

Unknown (U): This determination is characterized by the absence of information or data sufficient to adequately assess the significance of the impacts, either because the impact is impossible to predict, or because insufficient information is available to determine the condition of the resource.

4.1.7 Data Collection and Models for Estimating Impacts

4.1.7.1 Data Collection

The Consulting Team suggests that an interview-based data collection process from key informants be used to further understand current fishing practices and quantify the likely changes under each alternative. Changes in fishing practices will depend on a number of factors, such as relationships with processors, ex-processor prices, increased/decreased costs, or increased/decreased prices ex-vessel prices. As a result, the interviews will address information needed for a number of components of the overall analysis. The interviews will balance complexity and completion time requirements against the need for information on a number of topics. The contractor for Phase 2 may need to work with the Council staff to prepare an explanation and justification to the Office of Management and Budget for approval of the survey plan.

4.1.7.2 Models

This subsection provides an overview of possible model development for predicting how trawl groundfish harvesters and trawl groundfish processors would respond under each alternative. The choice of models depends upon the amount and quality of information available. The following bullets describe some of the data issues complicating model development for this EIS:

- Cost and earnings data for harvesters are still under development, and at best will be available only for a single year. A comprehensive predictive model would require information showing how costs change different OY levels and exogenous prices.
- Cost data for processors are unavailable and unlikely to become available in the timeframe of the analysis.
- Comprehensive primary data on processed products and product prices are unavailable.
- Final market demands for groundfish products are not well known.
- Data showing the total catch of groundfish by individual vessels are unavailable. Estimates of total catch are currently made in the NMFS Bycatch Model by combining observer data, logbook data, and landings data.

Given these data shortcomings and the advice of individual members of the IEP, the Consulting Team determined that a comprehensive predictive model would not be feasible for use in the EIS. Instead, the Consulting Team proposes to develop a set of models designed to focus on specific issues. These issues include:

- The distributional effects of the initial allocation of IFQs in a trawl IFQ program.
- The potential consolidation of the trawl groundfish harvesting sector following the allocation
- The potential to reduce catches of incidental species.
- The potential to increase profits

These models could be constructed using existing data sources, combined with the interview data discussed above and/or analysts' judgment to fill the numerous data gaps.

4.1.7.2.1 A Model to Project the Effects of the Initial Allocation of IFQ

The Consulting Team believes the initial allocation of IFQs will have a potentially significant effect on the way in which trawl groundfish harvesters and trawl groundfish processors prosecute the fishery. The Consulting Team believes that a careful examination of the initial allocation options, and a determination of how permit holders would fare relative to current participation levels, will provide an indication of the amount of change that may be expected in the fishery as a result of the initial allocations.

The initial allocation model would consist of four modules as follows:

1) **Historical Landings Module**: This module would include landings by year and species from 1994 - 2005 for individual permit holders, including data on participation in fisheries other than the West Coast groundfish trawl fishery. The module would also include data indicating the volume of purchases of trawl groundfish by individual buyers and processors. Finally the module would contain demographic information including vessel class, community of residence, physical location of processing facility, etc., for each potential recipient of IFQ.
2) **Allocation Rules Module**: This module would contain the specific allocation rules included in the alternatives. As described in Table 2-2, there are six different allocation splits between harvesters and processors included in the main suite of alternatives. All of the options in the main suite alternatives would allocate IFQs based on a historical landings basis, but the way that catch history is used varies by program. In addition to the allocation options in the main suite of alternatives, the Council has indicated that other allocation methodologies should be examined. These additional allocation methodologies are detailed in the 2nd half of the Components Table in Chapter 2. Most of these ancillary options merely tweak the allocation rules in the main suite by changing the eligibility years, the minimum landings requirements, or the length of the historical period. However one of the included ancillary options uses a very different methodology for allocating IFQ for overfished species and other incidentally caught groundfish. This methodology allocates IFQs for overfished and incidentally caught groundfish species in proportion to the amount of IFQ issued for target species--the proportions would be based on average incidental catch rates in recent years as estimated in the NMFS Bycatch Model.
3) **Incidental Catch Rate Module**: This module will consist of estimates of incidental catch rates of overfished species and other incidentally caught groundfish species on a target species basis for the years 2001 – 2005.[31] The estimates will be based on the NMFS Bycatch Model. This module will be used for two different purposes: 1) It will be used in conjunction with the Allocation Rules Module to project IFQ allocations under the option that allocates IFQs on the basis of incidental catch rates; 2) The Incidental Catch Rate Module will be used to examine the different allocation outcomes and to assess “winners and losers” among the initial quota recipients.
4) **Comparison Module**: In this module the allocations of IFQs will be compared to actual 2005 landings and ex-vessel values. Initial QS allocations will be translated to QPs based on the OYs and trawl apportionment targets from 2005. Ex-vessels prices from 2005 will be used to assign a “QP proxy value” to the hypothetical QP allocations for 2005. Each individual’s QP proxy value will be compared to the individual’s actual ex-vessel value of landings from 2005. The absolute value of the difference between the QP proxy value and the actual ex-vessel value is a measure of the “neutrality” of the allocation. Allocation options that result in relatively larger values indicate that the option would result in greater change from 2005 conditions.

[31] The WCGOP began collecting bycatch data in August 2001.

A second means of comparison using this module will examine the allocation of QP for overfished species, and compare this allocation to the "overfished species requirements" of each individual. Overfished species requirements would be calculated by applying the Incidental Catch Rate Module to hypothetical 2005 QP allocations of target species. The absolute value of the difference between each hypothetical overfished species QP allocation and estimated overfished species requirements in 2005 will be calculated. The larger this difference, the greater the change relative to 2005 conditions.

4.1.7.2.2 A Model to Assist in the Projections of Consolidation Effects

The Consulting Team believe that consolidation under the IFQ and permit stacking alternatives will be a key impact mechanism. The Consulting Team plans to develop a model to provide rough "order of magnitude" projections of the effects of consolidation. This model will not predict the level of consolidation, but rather will predict which permit holders are most likely to leave the fishery under a given level of consolidation. This information will be then be used in other models and in the community impact analysis. Actual levels of consolidation will be discussed in the context of the scenarios described in Subsection 4.1.4.3.

In general the Consulting Team believes that post-IFQ consolidation of the West Coast groundfish trawl fishery will depend on several factors as listed below:

1) Participation in 2005. The Consulting Team assumes that permit holders that did not participate in 2005, are unlikely to re-enter the West Coast groundfish trawl fishery regardless of their initial allocation. In other words the Consulting Team will assume that all initial quota recipients that did not also fish in 2005 will transfer their allocations and leave the fishery.
2) Ownership linkages to processors. The Consulting Team believes that—all other factors being equal—permit holders that have direct ownership linkages to processors are much more likely to remain in the fishery than other permit holders.
3) Relative efficiency within the vessel class in terms of average catch per day as reflected in log-book data. This will be used as a proxy for relative profitability—the Consulting Team does not believe that cost and earning data being developed in the ongoing NMFS survey will be adequate to measure relative profitability.
4) Relative ranking within the permit holder's vessel class in terms of gross revenue in 2005.
5) Relative ranking within the permit holder's vessel class in terms of the absolute difference between QP proxy value (discussed in the previous section) and actual 2005 ex-vessel value.
6) Relative ranking within the permit holder's vessel class in terms of the absolute difference between the hypothetical allocation of 2005 QP of overfished species (developed in the initial allocation model) and the permit holder's overfished species requirements.
7) Relative ranking within the permit holder's vessel class in terms of the dependence on trawl groundfish revenues as a percentage of all other fish harvesting revenues. The Consulting Team assumes that the greater the dependence on the West Coast groundfish trawl fishery the greater the likelihood of remaining in the fishery.

The consolidation model will calculate a weighted average of these factors and provide an overall ranking of each permit holder within its vessel class. The higher the ranking the greater the likelihood that permit holders within each vessel class would remain in the fishery under the various consolidation scenarios.

The final steps of the consolidation model rely on the assumption that each vessel that remains in the fishery would acquire enough target species QPs such that they end up with the same proportion of target species as they landed in 2005.

4.1.7.2.3 A Model to Estimate Potential Reductions in Incidental Catch Rates of Overfished Species

The need to reduce incidental catch of overfished species is believed to be a major impact mechanism in determining the behavioral changes under the IFQ alternatives. A critical question is whether existing data indicate that incidental catches can actually be reduced. The Consulting Team proposes to use the data developed for the NMFS Bycatch Model to project potential reductions in incidental catch rates and subsequently the levels of target catches that might be attained.

The **Incidental Catch Rate Reduction Model** will utilize observed incidental catch rates by haul, target strategy, and month from 2001 – 2005. Each haul will be ranked on the basis of incidental catch of overfished species relative to the catch of target species with ties going to the haul with the greater amount of target catch. These haul-by-haul records will examined based on specific assumptions about the ability of harvesters to reduce bycatch rates. For example it might be assumed that all hauls ranked at or below the 25th percentile over the course of the year (i.e., the 25% of hauls with the highest incidental catch per target species catch) would be eliminated from each target fishery. After these hauls are eliminated, the remaining hauls would be aggregated and a new incidental catch rate for the target species would be calculated. Next, all target catches would be expanded proportionally until the level of estimated 2005 trawl catch of the overfished species is reached. Finally average ex-vessel prices by month from 2005 would be applied to the catches of target species, and the result compared to the total ex-vessel value attained in 2005.

The following assumption sets are initially proposed:

1) Assume that all hauls ranked in the 25th percentile or less over the course of the year are eliminated from each target fishery.
2) Assume that all hauls ranked in the 50th percentile or less over the course of the year are eliminated from each target fishery.
3) Assume that all hauls ranked in the 25th percentile or less over the course of each two-month period are eliminated from each target fishery.[32]
4) Assume that all hauls ranked in the 50th percentile or less over the course of each two-month period are eliminated from each target fishery.
5) Assume that all hauls ranked in the 25th percentile by vessel class over the course of the year are eliminated from each target fishery
6) Assume that all hauls ranked in the 50th percentile by vessel class over the course of the year are eliminated from each target fishery.

4.1.7.2.4 A Methodology to Assist in the Projections of Ex-Vessel Prices

Ex-vessel prices by species are likely to have a significant influence on all of the potential impacts of the IFQ program. While trend in ex-vessel prices by month of landing or by volume can be thoroughly examined with PacFIN data, in they end, ex-vessel prices are influenced by many additional mechanisms that are not so easily studied. For example, ex-vessel prices are heavily influenced by retail prices and consumer demand, as well as the global substitute products. Unfortunately there do

[32] Under this and the following assumption set, the expansion of remaining hauls would be undertaken such that the proportion of target catches in each month would remain constant.

not appear to be many useful economic analyses in recent years that study consumer demand for groundfish product.

The influence of the market power of processors and harvesters on ex-vessel prices is also important, and IFQ clearly have the ability to shift the balance of power between harvesters and processors. However, the influence of market power is poorly understood, because market power is assumed not to exist in the basic economic theory of pure competition. Using the assumption of pure competition, economic theory is reasonably able to predict outcomes; if on the other hand pure competition cannot be assumed, then standard economic theory is unreliable, and game theory and experimental economics must be used.

The Consulting Team has had discussions with game theorists and practitioners of experimental economics, and there appears to be interest in working on this problem. It should be noted that experimental economic was used by the North Pacific Fishery Management Council in their analysis of processor shares in the IFQ program for crab.

Game theory and experimental economics are likely able to provide insights into the effects of an allocation of harvesting shares to processors, and on the potential affects that the IFQ system could have of ex-vessel prices. This may be a particularly important determinant in ability of harvesters to reduce incidental catch of overfished species.

4.1.7.2.5 A Model to Assess the Likelihood that Additional Profits Could Offset Additional Observer Costs

An important feature of all of the Action Alternatives is the requirement that all vessels in the West Coast groundfish trawl fishery carry observers 100 percent of the time, or use video monitoring equipment approved by NMFS at all times. Under the current management regime, it is considered infeasible to require this level of catch monitoring because the costs of the program could not be supported by the level of profits generated in the fishery. It is presumed that if the alternatives lead to increased profits, then requiring 100 percent observers or video monitoring could be justified.

This section describes the model that would be used to assess the likelihood that profits in the West Coast groundfish trawl fishery under the alternatives could increase enough to offset the increased costs of observers and monitoring.[33] Initial estimates of the cost of an expanded observer program in the West Coast groundfish trawl fishery range from $300-$1,000 per fishing day.

The “observer cost offset model” will utilize the incidental catch rate model in conjunction with the consolidation model to find combinations of: 1) potential revenue increases from higher targets species catches due to lower incidental catch rates of overfished species; and 2) fixed cost savings resulting from fleet consolidation. The combination of these results will be used to assess whether the potential for increase in profits for vessels in the different vessel classes could fully offset the cost of observers under the assumption that average catches per day of target species for the remaining vessel would remain at 2005 levels.

It is acknowledged that this is a relatively simplistic model; however more sophisticated models would require more information and certainty than are likely to be available.

4.1.7.2.6 A Profitability Model

The profit motive is a nearly universal impact mechanism that will be present in all of the alternatives. Potential changes in profits under the alternatives will be estimated using NMFS trawl vessel cost-

[33] It should not necessarily be inferred that the trawl industry would actually be required to cover the additional observer costs.

earnings survey results applied to each vessel class. This information, combined with the models listed above will be used to estimate the marginal revenue attainable on purchased QS based on a range of assumed change in variable costs scenarios. The components of the profitability model include:

- NMFS vessel cost-earnings survey data will be used to estimate the average fixed cost of vessels by vessel class, and the average variable cost per target pound.
- The consolidation model will be use to predict the number of vessels remaining in the fleet at varying levels of consolidation and improvement in incidental catch rates at those consolidation levels.
- The incidental catch rate model will be used to estimate potential additional catches and value of target species for each vessel class
- Fixed cost savings will be estimated based on the number of vessels remaining in each vessel class.
- Variable cost savings per target pound will be assumed. The Consulting Team assumes a priori that the following variable cost savings percentages will be used: 1) no change, a 5 percent reduction, and a 10 percent reduction.

4.2 Summary of the Potential Effects of the Alternatives

This section provides a broad overview of the potential impacts of the alternatives considered. Specifically, it discusses the major incentives that are likely to determine the way in which trawl groundfish harvesters and trawl groundfish processors prosecute the fishery under the different alternatives and highlights the socioeconomic consequences of those incentives.

This section also uses a tabular format to summarize the direct, indirect and cumulative effects of the alternatives. The summary table is shown in Table 4-1 on page 211 will utilize the significance criteria and ratings introduced in Section 4.1.6 for each of the indicators listed.

4.2.1 No-Action Alternative (Alternative 1)

The current management regime utilizes two-month cumulative trip limits to spread harvests out over the year. As a result of the legal requirement to minimize bycatch of overfished species, considerable harvest opportunity is being forgone. The OYs for many overfished species have been set at low levels, placing a major constraint on the industry's ability to fully harvest the available OYs of the more abundant target species that co-occur with the overfished species, wasting potential landings and revenues. Because overfished species are constraining catches of target species, permit holders are compelled to take multiple trips that increase operating costs and that fail to fully utilize vessel capacities.

The use of average discard rates for the fleet to project bycatch of overfished species, together with the absence of a requirement to report catches that are not landed, creates little direct incentive for individual vessels to do everything possible to reduce personal bycatch rates. Overall, the current management regime provides little individual bycatch accountability or opportunity or incentives for individuals to reduce bycatch.

Further, the current management regime is not responsive to the wide variety of fishing business strategies and operational concerns. For example, some fishermen would prefer to be able to pursue a more seasonal groundfish fishing strategy to take advantage of changes in market, weather, and harvest conditions that occur during the fishing year.

4.2.2 IFQ Alternatives (Alternatives 2 - 4)

The following subsection discusses the primary impact mechanism and behavior changes that are likely under the IFQ Alternative. While the alternatives are obviously not identical, they all carry with them the same basic impacts.

4.2.2.1 Potential Effects of Management Measures on Harvesters and Processors

A trawl IFQ program is intended to achieve the IFQ Project goals and objectives (Section 1.1.2) by imposing an alternative system of incentives (a.k.a. impact mechanisms) that would change the way in which trawl groundfish harvesters and trawl groundfish processors prosecute the fishery. The program would accomplish this through management measures that

- allocate annual IFQs;
- grant IFQ transferability; and
- require total catch reporting and monitoring.

The discussion below briefly discusses how these measures are expected to help achieve the ITQ Project goals and objectives, and identifies potential countervailing incentives that may limit the positive impacts.

The allocation of annual IFQs would remove the constraints on the timing of harvest under the current bimonthly cumulative trip limit regime, thereby allowing harvesters to optimize their fishing patterns during the year so as to maximize their net revenue on the amount of fish allocated to them. Removing the constraints on harvest timing would allow permit holders to time their activities so that greater amounts of target species can be harvested for a given amount of incidental catches of constraining overfished species. The removal of harvest timing constraints would also allow harvesters to consolidate their own fishing activities, rather than being forced by regulation to divide their harvesting activities into six two-month periods.

Notwithstanding the new freedom harvesters would have to time their fishing activities, buyers and processors of trawl groundfish are not likely to completely change their groundfish purchasing patterns in order for harvesters to maximize their profits. Buyers and processors would continue to time their purchasing and processing activities to meet their own market and capacity constraints. While harvesters may wish to harvest their entire IFQ of fish in one month, they must still find a buyer that is willing to pay a price for their catch that will cover their expenses.

The granting of transferability would allow harvesters to optimize the size of their allocation by matching their allocation with the harvesting capabilities of their vessels and crew. This, in turn, would lead to higher profits because the fixed costs of the fishing operation could be offset by a greater amount of revenues. Permit holders with an excess of overfished species quota will likely find willing buyers among those who have not been able to reduce their incidental catch of overfished species, or they will find willing sellers of target species quota.

Transferability not only would allow some permit holders to increase the size of their operations in order to increase profitability, it would also allow permit holders to leave the fishery with compensation. In other words, transferability is likely to cause consolidation of the trawl harvesting sector. This consolidation would remove redundant capital from the fishery as more efficient operations purchase the IFQs of less efficient operations.

Imposing a total catch reporting and monitoring requirement would make each vessel responsible and accountable for all groundfish caught, rather than the amounts retained. This increased accountability would provide an incentive for vessels to reduce their incidental catch rates of overfished species—in contrast to the status quo, actions to reduce incidental catch would provide benefits directly to the individual undertaking the change.

4.2.2.2 Potential Effects of Initial Allocation of IFQs on Harvesters and Processors

The specific details of the initial IFQ allocation rule chosen will also be a major impact mechanism. The initial allocation will cause behavioral changes in the trawl groundfish industry because the initial allocation will change the opportunities available to each initial assignee of IFQ. The only situation in which the initial allocation would not cause behavioral changes would be an allocation of IFQ to each permit holder active in the 2005 West Coast groundfish trawl fishery that meets the following conditions:

1) The allocation of pounds of each species is no less than the amount of that species the permit holder actually harvested;
2) Any additional pounds that can be allocated while remaining within the OY of each species would be allocated in proportion to the percentage of that species that each permit holder harvested.

Under such an allocation all of the participants in the 2005 West Coast groundfish trawl fishery could have harvested the amounts they actually harvested—no one would be better or worse off relative to the baseline conditions. Any other allocation would force permit holders to buy and sell quota shares to return to the level of participation they would have attained without the allocation.

An allocation that causes no one to be worse off is not necessarily consistent with the IFQ Program goals and objectives. Assume, for example, that a particular permit holder caught a large amount of an overfished species in 2005, thereby causing the entire fishery to be closed before the OYs of many species were harvested. An allocation that makes no one worse off would provide that permit holder with the ability to again shut down the fishery prematurely.

Permit holders will examine their initial allocation of IFQs to determine if it makes economic sense for them to remain in the fishery or to sell their allocation and leave the fishery. Of particular importance will be the initial allocation of overfished species. Permit holders that receive high allocations of overfished species, relative to their allocation of target species, will be in a better position to remain in the fishery, as they would be less likely to incur the cost of purchasing additional IFQs.

The allocation of harvesting IFQs to processors will also cause behavioral changes, as any such allocation means that harvesters would have to obtain additional IFQ in order to attain pre-allocation harvest levels. On the other hand, it has been argued that if an allocation were not provided to processors, the bargaining power of processors relative to harvesters would be compromised. A change in the relative bargaining positions would allow harvesters to increase their profitability at the expense of processors.

Processors would examine their initial allocation, and the relationships they have with permit holders that remain in the fishery to determine what they do with their harvest IFQs. Potential options for processors include: 1) transferring IFQs to harvesters at no or nominal cost to ensure continued deliveries of raw product; 2) selling or leasing IFQs to harvesters at the prevailing market prices; 3) using them to augment the catches of their own vessels.

Processors would also examine the markets for their groundfish product to determine the volumes the markets can bear. Of particular importance is the seasonality of demand. If periods of high demand correspond with periods of low incidental catch rates of overfished species, processors may encourage harvesters to increase their deliveries during that period. If periods of high demand coincide with periods of high incidental catch rates of overfished species, processor may have to offer harvesters higher prices to encourage larger deliveries.

4.2.2.3 Potential Indirect Effects

Many of the behavioural changes of harvesters and processors discussed above would result in indirect socioeconomic effects on stakeholder groups. For example, the decision of permit holders to leave the West Coast groundfish trawl fishery as a result of the initial allocation could result in:

- Lost employment opportunities for crew members.
- Loss of supplies of raw product to buyers and processors.
- Reduced demand for fishing inputs.
- A shift in fishing effort to other fisheries.
- Changes in the socioeconomic importance of fishing in coastal communities

4.2.3 Permit Stacking (Alternative 5)

The permit stacking alternative would continue the bimonthly cumulative trip limits currently used to manage the West Coast groundfish trawl fishery, but would include the following two differences:

Additional Transferability: Permit holders would be able to acquire additional permits, and each permit held (up to three) would result in an additional trip limit amount. If for example the cumulative trip limit for a species was set at 50,000 lbs, a permit holder with three permits would receive three cumulative trip limits for each period or 150,000 lbs. The additional transferability would allow permit holders to optimize their operations and provides industry funded compensation for those permit holder that wish to exit the fishery.

Total Catch Reporting and Monitoring: As in the IFQ Alternatives total catch reporting would be required as well as observers or video monitoring on all limited-entry trawl groundfish vessels.

4.2.4 Comparative Summary of the Alternatives

Table 4-1 provides a comparative summary table of the direct and indirect effects of the alternatives on resource and stakeholder groups. The table shows the key indicators or measurement criteria used to describe the potential impacts of the alternatives in terms of changes from baseline conditions. The columns in the table list the main suite of alternatives, along with the five different allocation programs associated with Alternative 3. The cells of the table indicate the significance of the predicted changes from baseline conditions using the significance ratings in Section 4.1.6. Table 4-2 is similar to Table 4-1 except that it lists the significance of cumulative effects.

Table 4-1. Summary of the Direct and Indirect Effects of the Alternatives

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Trawl Catcher Vessels									
Eligible Permit Holders									
Ex-vessel value to 2005 participants									
Value of transfers to restore participants to 2005 levels									
Permit Holders with Moderate Consolidation									
Number of days fished with Moderate Consolidation									
Fixed Cost Savings with Moderate Consolidation									
Value of additional target with moderate incidental catch rate improvements									
Observer costs with moderate consolidation and moderate incidental catch rate improvements									
Trawl Catcher Processors									
Eligible Permit Holders									
Ex-vessel Value of Allocation to 2005 participants									
Value of transfers to restore participants to 2005 levels									
Processors of Trawl Groundfish									
Eligible Processors									
Ex-vessel Value of Allocation									
Potential for changes in seasonality of raw product supply									
Potential for changes in bargaining power relative to harvesters									
Non-Trawl Commercial Harvesters									
Potential for additional participation by trawl groundfish harvesters									

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Other potential impacts									
Buyers and Processors that do Not Purchase Trawl Groundfish									
Changes in relative market share relative to trawl groundfish processors									
Recreational Harvesters of Groundfish									
Changes in political power relative to the trawl groundfish sector									
Communities									
Change in the number of trawl groundfish vessels by community									
Change in the number of buyers and processors of trawl groundfish									
Changes in the number of harvesting and processing jobs									
Changes to local input suppliers									
Relative dependency on trawl groundfish harvesting and processing									
Geographic distribution of harvests									
Changes in overall economic impact from fisheries									
Tribes									
Input Suppliers									
Changes in Revenue									
Wholesalers and Retailers									
Changes in product availability									
Consumers									
Changes in product price, quality and availability									
General Public									
Change in non-market value associated with the groundfish trawl fishery									
Changes in the non-market value									

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
of the marine ecosystem									
Management agencies									
Management Costs									
Enforcement Feasibility									
Reliability of Fishery Data									
Risk to the Resource									
Groundfish Resources									
Fishing Mortality									
Biomass Level									
Spatial/Temporal Concentration of Catch Population									
Prey Availability									
Habitat Suitability									
Other Fish Resources									
Fishing Mortality									
Biomass Level									
Spatial/Temporal Concentration of Catch									
Prey Availability									
Habitat Suitability									
Marine Mammals									
Incidental Take/Entanglement in Marine Debris									
Harvest of Prey Species									
Spatial/Temporal Concentration of Fishery									
Disturbance									
Seabirds									
Incidental Take in Gear and Vessel Strikes									
Prey Availability and Fishery Wastes									
Benthic Habitat									
Other Protected Resources									
Level of Fishing Effort									
Spatial/temporal characteristic of catch									
Prey Availability									

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Habitat Suitability									
Habitat									
Gear interactions with habitat by gear									
Location of interactions with habitat									
Habitat type affected									
Trophic Relationships									
Prey abundance									
Predator abundance									
Average trophic level									

Table 4-2. Summary of the Cumulative Effects of the Alternatives

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Trawl Catcher Vessels									
Eligible Permit Holders									
Ex-vessel value to 2005 participants									
Value of transfers to restore participants to 2005 levels									
Permit Holders with Moderate Consolidation									
Number of days fished with Moderate Consolidation									
Fixed Cost Savings with Moderate Consolidation									
Value of additional target with moderate incidental catch rate improvements									
Observer costs with moderate consolidation and moderate incidental catch rate improvements									
Trawl Catcher Processors									
Eligible Permit Holders									
Ex-vessel Value of Allocation to 2005 participants									
Value of transfers to restore participants to 2005 levels									
Processors of Trawl Groundfish									
Eligible Processors									
Ex-vessel Value of Allocation									
Potential for changes in seasonality of raw product supply									
Potential for changes in bargaining power relative to harvesters									
Non-Trawl Commercial Harvesters									
Potential for additional participation by trawl groundfish harvesters									
Other potential impacts									

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Buyers and Processors that do Not Purchase Trawl Groundfish									
Changes in relative market share relative to trawl groundfish processors									
Recreational Harvesters of Groundfish									
Changes in political power relative to the trawl groundfish sector									
Communities									
Change in the number of trawl groundfish vessels by community									
Change in the number of buyers and processors of trawl groundfish									
Changes in the number of harvesting and processing jobs									
Changes to local input suppliers									
Relative dependency on trawl groundfish harvesting and processing									
Geographic distribution of harvests									
Changes in overall economic impact from fisheries									
Tribes									
Input Suppliers									
Changes in Revenue									
Wholesalers and Retailers									
Changes in product availability									
Consumers									
Changes in product price, quality and availability									
General Public									
Change in non-market value associated with the groundfish trawl fishery									
Changes in the non-market value of the marine ecosystem									
Management agencies									

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Management Costs									
Enforcement Feasibility									
Reliability of Fishery Data									
Risk to the Resource									
Groundfish Resources									
Fishing Mortality									
Biomass Level									
Spatial/Temporal Concentration of Catch Population									
Prey Availability									
Habitat Suitability									
Other Fish Resources									
Fishing Mortality									
Biomass Level									
Spatial/Temporal Concentration of Catch									
Prey Availability									
Habitat Suitability									
Marine Mammals									
Incidental Take/Entanglement in Marine Debris									
Harvest of Prey Species									
Spatial/Temporal Concentration of Fishery									
Disturbance									
Seabirds									
Incidental Take in Gear and Vessel Strikes									
Prey Availability and Fishery Wastes									
Benthic Habitat									
Other Protected Resources									
Level of Fishing Effort									
Spatial/temporal characteristic of catch									
Prey Availability									

Stakeholders, Resources & Indicators	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Habitat Suitability									
Habitat									
Gear interactions with habitat by gear									
Location of interactions with habitat									
Habitat type affected									
Trophic Relationships									
Prey abundance									
Predator abundance									
Average trophic level									

4.3 Limited Entry Trawl Groundfish Catcher Vessels

This section describes the effects of the alternatives on limited-entry trawl groundfish catcher vessels.

The section begins with details of the analytical framework that will be utilized for the trawl groundfish catcher vessel sector (Section 4.3.1). The analytical framework describes the impact mechanisms, the indicators of measures of change and the significance thresholds that will be applied for each indicator.

Section 4.3.2 through Section 4.3.6 focuses successively on each of the alternatives. Section 4.3.4, which addresses Alternative 3 has separate subsection describing the effects of each of the five major options contained in the Alternative.

Each of the effects sections describes the direct, indirect and cumulative effects of the alternatives with respect to limited entry trawl groundfish catcher vessels. Within the assessment of each alternative there is a subsection that describes the direct and indirect effects. This subsection will be followed by an assessment of the cumulative effects for the alternative. Within each effects subsection the analysis has the following basic format:

1) Identifies and describes the impact mechanisms (or RFFAs) that are likely to change the conditions of stakeholders.
2) Projects the conditions of the stakeholder under the alternative using the indicators developed in more detail later in this framework section.
3) Compares the projected conditions with the baseline conditions and determines the significance of the change.

It should noted that because the trawl catcher vessels stakeholder group is the first stakeholder or resources group discussed, the Stage 1 outline shows all of the headings for the effects analysis sections. In order to limit the redundancy, later stakeholder and resource sections do not contain the same list of effects sections.

4.3.1 Analytical Framework for Trawl Catcher Vessels

Table 4-3 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) the models and data sets used in the analysis; and 5) the significance criteria or thresholds.

As described in Section 4.2, there are several key impact mechanisms or incentives for change that will affect catcher vessel behavior under all of the alternatives. These are listed below.

- o The economic incentive to increase profits, reduce costs and increase revenues
- o The need to reduce incidental catches of overfished species
- o The regulatory need to have total catch reporting and 100 percent observers or video monitoring

These key incentives manifest themselves in various ways within the different action alternatives.

- Under all of the action alternatives, the **total catch reporting, and observer and monitoring requirements** (all impact mechanisms) will induce changes in the following indicators for the trawl groundfish harvesters:

- Variable costs per fishing day
- Fixed cost per vessel

The following list describes impact mechanisms and indicators they are likely affect under the IFQ Alternatives:

- The **allocation rules specific to each alternative** change the distribution of the dedicated access privilege. Different allocation rules will result in changes in a number of indicators. These indicators are listed below:
  - Number of initial QS recipients, by class and the number that participated in 2005
  - Value of transfers to restore participants to 2005 level
  - Ex-Vessel Value of QPs allocated to 2005 participants
  - Value of QPs allocated to permit holder that did not participate in 2005
- Under an IFQ management regime **the profit motive** (an impact mechanism) will allow harvesters to increase profits (in this case a measure of change) and **reduce incidental catch rates of overfished species** (the need to reduce incidental catch rates is considered both an impact mechanism) by inducing changes in the following indicators:
  - The timing of fishing activities
  - The location of fishing patterns
  - The incidental catch rate of overfished species relative to target species
  - Total catch of target species
  - Total revenue from target species
  - Average variable cost per pound of target catch
- The IFQ system combined with the specific IFQ allocation rules, and the profit motive will allow harvesters to consolidate. Consolidation is also likely under the permit stacking alternative. In this context **consolidation is considered an impact mechanism** that will induce changes in the following indicators:
  - The number of active permit holders and vessels
  - The number of crewmembers
  - The total fixed cost in the trawl groundfish fleet
  - Changes in the number of fishing days per vessel
  - Additional changes in the variable cost per pound of target species
- The IFQ alternatives will also provide harvesters with an **increased amount of certainty** that the actions of other harvesters will not negatively affect their ability to harvest the fish allocated to them. The increased certainty is an impact mechanism that could affect the following indicators:
  - The incidental catch rate of overfished species relative to target species
  - Safety-related incidents & accidents
  - The timing of fishing activities
  - The location of fishing patterns

- The relative bargaining power vis-à-vis processors of trawl groundfish

Table 4-3 provides an overview of the impact mechanism, indicators or measures of impact and the significance thresholds that will be used. For quantitative indicators, this section will utilize a significance threshold of +/- 20 percent to indicate whether the measured change in the indicator from the comparative baseline is significant. The same threshold is used to roughly assess changes in qualitative indicators (e.g., fishing vessel safety). Changes in quantitative indicators will be based on model projections as described in subsection 4.1.7.2 combined with the scenarios described in Subsection 4.1.4; predicted changes in qualitative indicators are based on the judgment of the socioeconomic analysts.

Table 4-3. Impact Mechanisms and Indicators, and Significance Thresholds for Trawl Catcher Vessels

Impact Mechanisms	Indicator or Measure of Impact	Significance Thresholds
IFQ Allocation Rules	Number of initial QS recipients	+/- 20% change
IFQ Allocation Rules	Number of initial QS recipients that participated in 2005	+/- 20% change
IFQ Allocation Rules	Ex-Vessel value of QPs allocated to 2005 participants	+/- 20% change
IFQ Allocation Rules	Ex-vessel value of transfers to restore participants to 2005 level	+/- 20% change
IFQ Allocation Rules	Ex-Vessel value of QPs allocated to permit holders that did not participate in 2005	+/- 20% change
Initial Allocation Rules, Increased Certainty	Relative market power of harvesters & processors	Qualitative judgment of analysts
Profit Motive, Increased Certainty Reduce Incidental Catch Rates, Reporting and Monitoring Requirements	Incidental catch rates of overfished species	+/- 20% change
Reduce Incidental Catch Rates, Profit Motive,	Seasonal distribution of fishing effort	Chi-square tests
Reduce Incidental Catch Rates, Profit Motive, Consolidation	Geographic distribution of effort	Chi-square tests
Reporting and Monitoring Requirements, Profit Motive, Reduce Incidental Catch Rates	Total Discards	+/- 20% change
Profit Motive, Reduce Incidental Catch Rates	Higher target OY utilization rates	+/- 20% change
Profit Motive, Reduce Incidental Catch Rates	Total ex-vessel revenue	+/- 20% change
Consolidation, Increased Certainty	Safety-related incidents & accidents	Qualitative judgment of analysts
Profit Motive	Crew/skipper shares	+/- 20% change
Reduce Incidental Catch Rates, Monitoring Requirements, Profit motive	Variable cost per target pound	+/- 20% change
Monitoring Requirements, Profit Motive	Variable cost per day	+/- 20% change
Profit Motive, IFQ Allocation Rules, Consolidation	Number of active vessels	+/- 20% change
Profit Motive, IFQ Allocation Rules, Consolidation	Number of permit holders	+/- 20% change
Profit Motive, Consolidation, Reduce Incidental Catch Rates, Monitoring Requirements	Number of trips per year	+/- 20% change
Profit Motive, Consolidation, Reduce Incidental Catch Rates, Monitoring Requirements	Number of fishing days per year	+/- 20% change
Profit Motive, Monitoring Requirements	Vessel-level fixed cost	+/- 20% change
Consolidation	Fleet-wide fixed Cost	+/- 20% change
Consolidation, Profit Motive	Number of crew members	+/- 20% change
Profit Motive, Consolidation, Reduce Incidental Catch Rates, Monitoring Requirements	Vessel Level Profitability	+/- 20% change
Consolidation, Profit Motive, Reduce Incidental Catch Rates, Monitoring Requirements	Fleet-wide Profits	+/- 20% change
Reduce Incidental Catch Rates, Profit Motive, Initial Allocation Rules, Reporting and Monitoring Requirements	Market value of QS	+/- 20% change

Table 4-4 provides a comparative summary table of the direct and indirect effect of the alternatives with respect to trawl groundfish catcher vessels. The rows in the table show the indicators of change as described in Table 4-3. The columns in the table list the main suite of alternatives, along with the 5 different allocation programs associated with Alternative 3. The cells of the table will reflect the significance criteria and ratings developed for the indicator in the direct and indirect effects analysis in Section 4.3.2 through Section 4.3.5.1. Table 4-5 is similar to Table 4-4 except that it lists the significance criteria and ratings for the cumulative effects.

Table 4-4. Summary of the Direct and Indirect Effects of the Alternatives on Trawl Groundfish Catcher Vessels

	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Indicator									
Number of initial QS recipients									
Number of initial QS recipients that participated in 2005									
Ex-Vessel value of QPs allocated to 2005 participants									
Ex-vessel value of transfers to restore participants to 2005 level									
Ex-Vessel value of QPs allocated to permit holders that did not participate in 2005									
Relative market power of harvesters & processors									
Incidental catch rates of overfished species									
Seasonal distribution of fishing effort									
Geographic distribution of effort									
Total Discards									
Higher target OY utilization rates									
Total ex-vessel revenue									
Safety-related incidents & accidents									
Crew/skipper shares									
Variable cost per target pound									
Variable cost per day									
Number of active vessels									
Number of permit holders									
Number of trips per year									
Number of fishing days per year									
Vessel-level fixed cost									
Fleet-wide fixed Cost									
Number of crew members									
Vessel Level Profitability									
Fleet-wide Profits									
Market value of QS									

Table 4-5. Summary of the Cumulative Effects of the Alternatives

	Alternative 1	Alternative 2	Alternative 3A	Alternative 3Ba	Alternative 3Bb	Alternative 3Bc	Alternative 3C	Alternative 4	Alternative 5
Indicator									
Number of initial QS recipients									
Number of initial QS recipients that participated in 2005									
Ex-Vessel value of QPs allocated to 2005 participants									
Ex-vessel value of transfers to restore participants to 2005 level									
Ex-Vessel value of QPs allocated to permit holders that did not participate in 2005									
Relative market power of harvesters & processors									
Incidental catch rates of overfished species									
Seasonal distribution of fishing effort									
Geographic distribution of effort									
Total Discards									
Higher target OY utilization rates									
Total ex-vessel revenue									
Safety-related incidents & accidents									
Crew/skipper shares									
Variable cost per target pound									
Variable cost per day									
Number of active vessels									
Number of permit holders									
Number of trips per year									
Number of fishing days per year									
Vessel-level fixed cost									
Fleet-wide fixed Cost									
Number of crew members									
Vessel Level Profitability									
Fleet-wide Profits									
Market value of QS									

4.3.2 Alternative 1: The No-Action Alternative

The analysis of effect of Alternative 1 will be relatively straight-forward compared to the effects analyses of the Action Alternatives. This is because Alternative 1 is very similar to status quo.

4.3.2.1 Direct and Indirect Effects Analysis

The analysis of effect of Alternative 1 will be relatively straight-forward compared to the effects analyses of the Action Alternatives. This is because Alternative 1 is very similar to status quo.

In general the analysis will describe the overall effects of the bulleted list of items in Section 4.1.1 beginning on page 195.

The analysis will also project the likely potential changes in the indicators that result from the applicable scenarios described in Section 4.1.4 beginning on page 198. In addition the cumulative effect analysis under Alternative 1 will describe and discuss most of the RFFAs that are likely affect the outcomes under all of the alternatives. The initial list of RFFAs is provided in Section 4.1.5.

4.3.2.1.1 Projected Conditions of the Indicators under the Alternative

4.3.2.1.2 Changes from the Baseline Conditions

4.3.2.2 Cumulative Effect Analysis

4.3.2.2.1 Discussion of Likely RFFAs

4.3.2.2.2 Projected Conditions of the Indicators under the Alternative

4.3.2.2.3 Changes from the Baseline Conditions

4.3.3 Alternative 2: IFQs for Whiting and Trawl Target Species

4.3.3.1 Direct and Indirect Effects Analysis

4.3.3.1.1 Projected Conditions of the Indicators under the Alternative

4.3.3.1.2 Changes from the Baseline Conditions

4.3.3.2 Cumulative Effect Analysis

4.3.3.2.1 Discussion of Likely RFFAs

4.3.3.2.2 Projected Conditions of the Indicators under the Alternative

4.3.3.2.3 Changes from the Baseline Conditions

4.3.4 Alternative 3: IFQs for All Groundfish except Other Species

Alternative 3 consists of five major options. The options vary by the allocation rules used. Because it is expected that the initial allocation of IFQ will be one of the most important impact mechanisms the Consulting Team believes it is important to treat each of these major options as a stand-alone alternative in the effects analysis.

4.3.4.1 Alternative 3A: IFQ for all but Other Species with 50/50 QS Allocation Split between Harvesters and Processors

4.3.4.1.1 Direct and Indirect Effects Analysis

4.3.4.1.1.1 Projected Conditions of the Indicators under the Alternative

4.3.4.1.1.2 Changes from the Baseline Conditions

4.3.4.1.2 Cumulative Effect Analysis

4.3.4.1.2.1 Discussion of Likely RFFAs

4.3.4.1.2.2 Projected Conditions of the Indicators under the Alternative

4.3.4.1.2.3 Changes from the Baseline Conditions

4.3.4.2 Alternative 3Ba: IFQ for all but Other Species with a 100/0 QS Allocation Split between Harvesters and Processors

4.3.4.2.1 Direct and Indirect Effects Analysis

4.3.4.2.1.1 Projected Conditions of the Indicators under the Alternative

4.3.4.2.1.2 Changes from the Baseline Conditions

4.3.4.2.2 Cumulative Effect Analysis

4.3.4.2.2.1 Discussion of Likely RFFAs

4.3.4.2.2.2 Projected Conditions of the Indicators under the Alternative

4.3.4.2.2.3 Changes from the Baseline Conditions

4.3.4.3 Alternative 3Bb: IFQ for all but Other Species with a 90/10 QS Allocation Split between Harvesters and Processors

4.3.4.3.1 Direct and Indirect Effects Analysis

4.3.4.3.1.1 Projected Conditions of the Indicators under the Alternative

4.3.4.3.1.2 Changes from the Baseline Conditions

4.3.4.3.2 Cumulative Effect Analysis

4.3.4.3.2.1 Discussion of Likely RFFAs

4.3.4.3.2.2 Projected Conditions of the Indicators under the Alternative

4.3.4.3.2.3 Changes from the Baseline Conditions

4.3.4.4 Alternative 3Bc: IFQ for all but Other Species with a 50/50 QS Allocation Split between Harvesters and Processors for Whiting and a 100/0 Split for Non-whiting

4.3.4.4.1 Direct and Indirect Effects Analysis

4.3.4.4.1.1 Projected Conditions of the Indicators under the Alternative

4.3.4.4.1.2 Changes from the Baseline Conditions

4.3.4.4.2 Cumulative Effect Analysis

4.3.4.4.2.1 Discussion of Likely RFFAs

4.3.4.4.2.2 Projected Conditions of the Indicators under the Alternative

4.3.4.4.2.3 Changes from the Baseline Conditions

4.3.4.5 Alternative 3C: IFQ for all but Other Species with 75/25 QS Allocation Split between Harvesters and Processors

4.3.4.5.1 Direct and Indirect Effects Analysis

4.3.4.5.1.1 Projected Conditions of the Indicators under the Alternative

4.3.4.5.1.2 Changes from the Baseline Conditions

4.3.4.5.2 Cumulative Effect Analysis

4.3.4.5.2.1 Discussion of Likely RFFAs

4.3.4.5.2.2 Projected Conditions of the Indicators under the Alternative

4.3.4.5.2.3 Changes from the Baseline Conditions

4.3.5 Alternative 4: IFQs for All Groundfish Species

4.3.5.1 Direct and Indirect Effects Analysis

4.3.5.1.1 Projected Conditions of the Indicators under the Alternative

4.3.5.1.2 Changes from the Baseline Conditions

4.3.5.2 Cumulative Effect Analysis

4.3.5.2.1 Discussion of Likely RFFAs

4.3.5.2.2 Projected Conditions of the Indicators under the Alternative

4.3.5.2.3 Changes from the Baseline Conditions

4.3.6 Alternative 5: Permit Stacking

4.3.6.1 Direct and Indirect Effects Analysis

4.3.6.1.1 Projected Conditions of the Indicators under the Alternative

4.3.6.1.2 Changes from the Baseline Conditions

4.3.6.2 Cumulative Effect Analysis

4.3.6.2.1 Discussion of Likely RFFAs

4.3.6.2.2 Projected Conditions of the Indicators under the Alternative

4.3.6.2.3 Changes from the Baseline Conditions

4.4 Trawl Catcher Processors

4.4.1 Analytical Framework for the Assessment of Effects on Trawl Catcher Processors

In general the assessment of the impacts of the alternatives on catcher processors will mirror the assessment of impacts on catcher vessels. A key difference, however, is the fact that with catcher processors there is no uncertainty generated from the relationship between harvesters and processors. Furthermore, the impacts of the IFQ alternative will be minimized by that catcher processors already operate in rationalize manner through their cooperative. Therefore they are unlikely to realize significant changes in incidental catch, the utilization of target species. If is likely, however that the initial allocation rules could have a measurable affect on catcher processors. To the extent that the initial allocation rule provides catcher processors with QS and QP that match their current use, impacts of the IFQ program will be likely be minimal. However, given that catcher processors have used observers on all of their vessels 100 of the time (and therefore all of their catch is reported), it is possible they will receive a disproportionate amount of QS for certain species that other catcher vessel have not reported.

Table 4-6 provides an overview of the impact mechanism, indicators or measures of impact and the significance thresholds that will be used. For quantitative indicators, this section will utilize a significance threshold of +/- 20 percent to indicate whether the measured change in the indicator from the comparative baseline is significant. The same threshold is used to roughly assess changes in qualitative indicators (e.g., fishing vessel safety). Changes in quantitative indicators will be based on model projections as described in subsection 4.1.7.2 combined with the scenarios described in Subsection 4.1.4; predicted changes in qualitative indicators are based on the judgment of the socioeconomic analysts.

Table 4-6. Impact Mechanisms and Indicators, and Significance Thresholds for Trawl Catcher Processors

Impact Mechanisms	Indicator or Measure of Impact	Significance Thresholds
IFQ Allocation Rules	Number of initial QS recipients	+/- 20% change
IFQ Allocation Rules	Number of initial QS recipients that participated in 2005	+/- 20% change
IFQ Allocation Rules	Ex-Vessel value of QPs allocated to 2005 participants	+/- 20% change
IFQ Allocation Rules	Ex-vessel value of transfers to restore participants to 2005 level	+/- 20% change
IFQ Allocation Rules	Ex-Vessel value of QPs allocated to permit holders that did not participate in 2005	+/- 20% change
Profit Motive, Increased Certainty Reduce Incidental Catch Rates, Reporting and Monitoring Requirements	Incidental catch rates of overfished species	+/- 20% change
Reduce Incidental Catch Rates, Profit Motive,	Seasonal distribution of fishing effort	Chi-square tests
Reduce Incidental Catch Rates, Profit Motive, Consolidation	Geographic distribution of effort	Chi-square tests
Reporting and Monitoring Requirements, Profit Motive, Reduce Incidental Catch Rates	Total Discards	+/- 20% change
Profit Motive, Reduce Incidental Catch Rates	Higher target OY utilization rates	+/- 20% change
Profit Motive, Reduce Incidental Catch Rates	Total ex-vessel revenue	+/- 20% change
Consolidation, Increased Certainty	Safety-related incidents & accidents	Qualitative judgment of analysts
Profit Motive	Crew/skipper shares	+/- 20% change
Reduce Incidental Catch Rates, Monitoring Requirements, Profit motive	Variable cost per target pound	+/- 20% change
Monitoring Requirements, Profit Motive	Variable cost per day	+/- 20% change
Profit Motive, IFQ Allocation Rules, Consolidation	Number of active vessels	+/- 20% change
Profit Motive, IFQ Allocation Rules, Consolidation	Number of permit holders	+/- 20% change
Profit Motive, Consolidation, Reduce Incidental Catch Rates, Monitoring Requirements	Number of trips per year	+/- 20% change
Profit Motive, Consolidation, Reduce Incidental Catch Rates, Monitoring Requirements	Number of fishing days per year	+/- 20% change
Profit Motive, Monitoring Requirements	Vessel-level fixed cost	+/- 20% change
Consolidation	Fleet-wide fixed Cost	+/- 20% change
Consolidation, Profit Motive	Number of crew members	+/- 20% change
Profit Motive, Consolidation, Reduce Incidental Catch Rates, Monitoring Requirements	Vessel Level Profitability	+/- 20% change
Consolidation, Profit Motive, Reduce Incidental Catch Rates, Monitoring Requirements	Fleet-wide Profits	+/- 20% change
Reduce Incidental Catch Rates, Profit Motive, Initial Allocation Rules, Reporting and Monitoring Requirements	Market value of QS	+/- 20% change

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.4.2 through 4.4.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.5 Processors of Trawl Groundfish

4.5.1 Analytical Framework for the Assessment of Effects on Processors of Trawl Groundfish

Table 4-7 provides an overview of the analytical approach used to compare baseline and future conditions of processors or Trawl-caught groundfish. The table lists: 1) mechanisms that relate the proposed action to the impacts; 2) potential impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) significance criteria or thresholds. In general, the Action Alternatives create or enhance mechanisms that have the potential cause behavioral changes on the part of buyers and processors of trawl-caught groundfish, and on the trawl groundfish harvesters. These behavioral changes have the potential to create impacts, which in turn manifest themselves in the form of indicators of change. In general, the indicators of change are measurable with existing or predictable with models or other analytical tools. The extent that indicators change, relative to the baseline conditions, is an indication of the significance of the impact.

Table 4-7. Impact Mechanisms, Indicators and Significance Thresholds for Trawl Groundfish Processors under the Alternatives

Impact Mechanisms	Potential Impacts	Indicator	Significance Threshold
Allocation to Processors	Lack of allocation to independent buyers may force some to exit	Number of processors groups, facilities and buying stations	+/- 20 percent and qualitative judgment of analysts
Reduction in incidental catch rates	Increased Target Species Utilization	Total purchases of trawl-caught groundfish by species	+/- 20 percent and qualitative judgment of analysts
Allocation to Processors	Lack of allocation to independent buyers may force some to exit	Geographic distribution of facilities and buying stations by community	+/- 20 percent plus qualitative judgment of analysts
Allocations to processors	Changes in competition and changing relationships with harvesters		
Increased Certainty and flexibility			
Reduction in incidental catch rates	Geographic redistribution of harvests		
Reduction in incidental catch rates	Increased Target Species Utilization	Ex-Vessel Prices by species	+/- 20 percent and qualitative judgment of analysts
Reduction in incidental catch rates	If timing of harvests change, and supply at certain time change, then processors may same prices to influence supply		
Allocations to Processors	Changes in Market Power (processors may use QP on own vessels)		
Increased certainty and flexibility	New products or Markets may open		
Allocation to processors	Lack of allocation to independent buyers may force some to exit		
Harvester action to reduce incidental catch rates	If timing of harvests change, and supply at certain time change, then processors may same prices to influence supply	Distribution of purchases by month	+/- 20 percent and qualitative judgment of analysts
Increased certainty and flexibility	New products form may be developed and the mix of existing products may change.	Product mix by species	Qualitative judgment of analysts
Increased certainty and flexibility	If timing of harvests change, and	Product recovery rates by	Qualitative judgment of

Impact Mechanisms	Potential Impacts	Indicator	Significance Threshold
	supply at certain time change	product and species	analysts
Increased certainty and flexibility	Processors may be able to tweak processing lines		
Allocation to Processors	Harvester will need to acquire additional shares from Processors	Relationships with harvesters	Qualitative Judgment of Analysts
Allocation to Processors	Drives independent buyers out		
No Allocation to processors	Harvesters more likely to search out and find new markets		
Combination of above mechanisms	Combination of above impacts	Total ex-vessel value of purchases	+/- 20 percent and qualitative judgment of analysts
Combination of above mechanisms	Combination of above impacts	Total wholesale value of production	+/- 20 percent and qualitative judgment of analysts
Combination of above mechanisms	Combination of above impacts	Total operating costs	+/- 20 percent and qualitative judgment of analysts
Combination of above mechanisms	Combination of above impacts	Net revenues	+/- 20 percent and qualitative judgment of analysts
Combination of above mechanisms	Combination of above impacts	Relative dependency of West Coast trawl groundfish	+/- 20 percent and qualitative judgment of analysts
Combination of above mechanisms	Combination of above impacts	Processing employment	+/- 20 percent and qualitative judgment of analysts

4.5.1.1 Analytical Methods

The Consulting Team believes *a priori* that in addition need to increase profits, there are three primary mechanisms through which the IFQ alternatives influence behavior changes on the part of the buyers and processors of trawl groundfish. These mechanisms include: 1) the allocation to processors (or the lack thereof); 2) harvester actions to reduce incidental catch rates; 3) the increased certainty and flexibility inherent in IFQ systems. The impact mechanisms cause processors (and harvesters) to change their behavior. The behavior changes create impacts. In the table, the second column links the impact mechanism to the potential impact. In turn the impact is linked to a measurable indicator of change. Note that there may be several mechanisms that lead to a particular impact. Furthermore there may be several impacts that are manifest in a single indicator.

The following discussion focuses on each of the indicators listed in Table 4-7, and explains the reasoning and assumption employed, and describes the proposed analytical approach the Consulting Team proposes to use in the assessment of effects.

Table 4-8. Analytical Methods for Projecting Changes in Indicators for Processors of Trawl Groundfish

Indicator of Change	Analytical Methods
Number of processors groups, facilities and buying stations	The initial allocation rules will be used in the initial allocation model (described in Section 4.1.7.2) along with data gathered in key interviews to determine the number of independent buyers that will not receive harvesting QS. The Consulting Team believes *a priori* that the magnitude of the impacts will depend on specific allocation rules, specifically on: 1) the amount allocated to processors (options range from 0 percent to 50 percent); and 2) on the definition of processors to whom allocations would be provided. If independent buyers are allocated QS then it is more likely these firms would remain viable. If secondary processors are allocated QS then it is likely that these businesses may become more involved in primary processing and the numbers of buyers would increase.
Total purchases of trawl-caught groundfish by species	The total purchases of trawl caught groundfish will increase relative to the No-Action Alternative, if harvesters can reduce their incidental catch rates of overfished species. The incidental catch rate model described in Section 4.1.7.2, utilizes catch rate data by target species and month, and variance between individual harvesters. The model is not able to take into account the influence of processors on incidental catch rates. The Consulting Team believes that processors can have a major impact on incidental catch rates (and thus overall utilization of target species) through ex-vessel price signals and through other working arrangements with harvesters. Unfortunately there does not appear to be a way to quantify these influences, and therefore the model result will be augmented with qualitative assessments and the use of what-if scenarios
Distribution of facilities and buying stations by community	The distribution of processing facilities under the alternative will by the number of processors—which as discussed above is likely to change as a result of the alternatives. The distribution buyer and processors will also be influenced by the need to reduce incidental catches of overfished species to the extent that harvester will changed their fishing locations. The distribution of buyers and processor will also be influenced by the increased certainty and flexibility inherent in an IFQ system. If multi-location processors are relatively certainty they will receive adequate supplies then they may choose to alter the geographic location of their facilities. Projecting the geographic distribution of facilities will utilize the initial allocation model and the incidental catch rate model, along with data from key informant interviews. While some of the information will be quantifiable other parts will be based on the qualitative judgment of the analyst.

Indicator of Change	Analytical Methods
Ex-Vessel Prices by species	The effects on ex-vessel prices under an IFQ system are of critical importance. Ex-vessel prices paid to harvester by species will be influence by the preceding impacts that have already been discussed. In other words if there are significant changes in the number of buyers and processors, the amount of fish they are buying or their geographic distribution, then there are also likely to be changes in the ex-vessel prices. In addition, the ex-vessel prices paid will be influenced by the needs of harvesters reduce incidental catches. Depending on relative market power processors can influence the timing of harvests through price signals. For example if a particular processors wants to discourage too much harvest in a particular month in which there are relatively low incidental catch rates, then that processor could lower prices for the target species in that month. If the processor has sufficient market power then, even if other processors do not follow suit, that processor would not expect an overall reduction in the amount of deliveries to its facilities. If the market leader is able to maintain those lower prices, then in the long-run it would be expected that other processor (those with less market power) would follow the leader and lower prices as well. As discussed in Subsection 4.1.7.2.4, the Consulting Team is investigation the use of experimental economics to help determine potential affects of the alternatives on ex-vessel price.
Distribution of purchases by month	As indicated in the previous row of the table, the distribution of purchases by month will be influence by consumer demand, relative market of processor and harvesters, and temporal differentials in incidental catch rate of overfished species. The incidental catch rate model, augmented with key informant interviews and, possibly augmented with results from an experimental economic study, will inform the analysis.
Product mix by species	The increased certainty and flexibility of an IFQ system are likely to influence the variety of product types and amounts generated from the groundfish trawl fishery. In other fisheries around the world that moved to an IFQ system, product mix changed significantly. Because the West Coast trawl groundfish fishery cannot be characterized as a race-for-fish, the change in this indicator may not be significant. Key informant interview will be the primary means used to evaluate changes in this indicator.

Indicator of Change	Analytical Methods
Product recovery rates by product and species	The increased certainty and flexibility of an IFQ system are likely to influence product recovery rates generated from the groundfish trawl fishery. In other fisheries around the world that moved to an IFQ system, product recovery rates improved significantly. Because the West Coast trawl groundfish fishery cannot be characterized as a race-for-fish, the change in this indicator may not be significant. Key informant interview will be the primary means used to evaluate changes in this indicator.
Relationships with harvesters	As discussed in previous rows of this table, the relationships between harvesters and processors are likely to be affected by the IFQ allocations. The initial allocation rules will in large part determine the direction of change. If processors are not allocated any harvesting IFQs then it is likely that harvesters will gain bargaining strength relative to processors. If processors are allocated harvesting shares, then the magnitude of the change in bargaining power will shift back to toward processors. At some (currently unknown) level, an allocation of IFQs to processors will lead to an increase in processor bargaining power relative to harvesters. Key informant interview will be a primary source of information. The interview will attempt to delineate the relationship under the baseline conditions to assess potential changes in those relationships under the alternatives. As discussed previously, quantifying the shift in bargaining power will not be easy. Key informant interview will be used, and it is possible that game theory and experimental economics may also be utilized.
Total ex-vessel value of purchases	The total ex-vessel value of purchases will be quantifiable under a set of assumptions about incidental catches, the timing of harvests, and improvements in the utilization of target species OYs. As indicated above however, the Consulting Team fully expects some unquantifiable changes in ex-vessel prices. The analysis will provide a quantitative assessment augmented with qualitative judgments.
Total wholesale value of production	The total wholesale value of production will be quantifiable under a set of the same set of assumptions discussed in the previous row along with data from key informants about production by product types and product prices. As indicated above however, the Consulting Team fully expects some unquantifiable changes in wholesale prices, and product volumes. The analysis will provide a quantitative assessment augmented with qualitative judgments.
Total operating costs	Very little data regarding operating costs of processors are likely to be available. The analysis will provide a qualitative assessment on the basis of findings with respect to number of processors, timing of production, and volume of product.
Net revenues	As with operating costs this will be qualitative assessment relying on findings on the indicator discussed above.

Indicator of Change	Analytical Methods
Relative dependency of West Coast trawl groundfish	This indicator will be based on total ex-vessel purchases of both groundfish and non-groundfish. It will assume that non-groundfish purchases remain constant. The estimates will also influenced by finding with respect to the number and type of processors that remain in the fishery under the alternatives. As with the assessment of changes in total ex-vessel value the analysis will provide both quantitative estimates and qualitative judgments.
Processing employment	Processing employment is expected to change in a similar manner as total wholesale value. The Consulting Team plans to utilize processing employment data from each State's labor department. These data are fairly reliable given that the existence and use of standardize codes that show the show processing employment. These data will be augmented by estimates of processing labor relative to wholesale value on motherships.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.5.2 through 4.5.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.6 Non-Trawl Commercial Harvesters

4.6.1 Analytical Framework for the Assessment of Effects on Non-Trawl Commercial Harvesters

Table 4-9 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-9. Impact Mechanisms, Indicators, and Significance Thresholds for Non-Trawl Commercial Harvesters under the Alternatives

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Change in the participation, fishing patterns and economic performance of non-trawl commercial harvesters	Consolidation of trawl harvest operations results in spillovers in other fisheries. Management of trawl fleet influences management of non-trawl vessels.	Number of participating catcher vessels	Available literature, together with expert opinion and other pertinent information, will play a critical role in the analysis of each criterion	Will not be able to derive quantitative threshold, will discuss qualitatively
		Landings, ex-vessel revenues and ex-vessel prices by species		
		Distribution of landings by month		
		Geographic distribution of effort		
		Distribution of ex-vessel revenue by permit holder residence		

4.6.1.1 Potential Impacts and Impact Mechanisms

While non-trawl vessels, and their owners and crew, would not be directly affected by the three IFQ alternatives (Alternatives 2 – 4), they may be indirectly affected. The most obvious indirect effects are the economic impacts of spillovers resulting from fleet consolidation. If the trawl fleet consolidates, vessels and crew members no longer employed in trawl fisheries will potentially be able to switch into non-trawl fisheries. The increased effort in non-trawl fisheries would likely have a negative impact on the economic performance of the fishers already engaged in those fisheries. These changes in economic performance could, in turn, affect participation levels and fishing patterns. Management action taken with respect to the trawl fleet could influence future actions taken with respect to non-trawl vessels. Any projection of changes in the management regime for non-trawl vessels would be speculative, but future management actions would likely lead to changes in the conditions of these vessels.

4.6.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 are used to evaluate the effects of the alternatives.

Quantitative significance thresholds are inappropriate because of the absence of data and models. Instead, qualitative judgments as to the significance of effects will be made.

4.6.1.3 Methods, Models, and Data Sets

Available literature, together with expert opinion and other pertinent information, will play a critical role in the analysis of each criterion.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.6.2 through 4.6.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.7 Buyers and Processors that do Not Purchase Trawl Groundfish

4.7.1 Analytical Framework for the Assessment of Effects on Buyers and Processors that do Not Purchase Trawl Groundfish

Table 4-10 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-10. Impact Mechanisms, Indicators, and Significance Thresholds for Buyers and Processors that do Not Purchase Trawl Groundfish under the Alternatives

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Change in the processing patterns and economic performance of buyers and processors that do not purchase trawl groundfish	Restrictions in ability to enter the trawl-caught groundfish processing market. Increased competition.	Number of buyers and facilities	Available literature, together with expert opinion and other pertinent information, will play a critical role in the analysis of each criterion	Will not be able to derive quantitative threshold, will discuss qualitatively
		Total purchases by fishery		
		Relative market share		
		Geographic distribution of participation		

4.7.1.1 Potential Impacts and Impact Mechanisms

Because buyers and processors that do not purchase trawl groundfish are not involved in the West Coast groundfish trawl fishery they will not be directly affected by the three IFQ alternatives (Alternatives 2 – 4). However, these buyers and processors would be indirectly affected if a trawl IFQ program restricts their ability to enter the trawl-caught groundfish processing market in the future. They would also be affected if higher profits for processors of trawl groundfish encourages these processors to increase their level of activity in non-trawl groundfish fisheries or non-groundfish fisheries. The potential restrictions on market entry and increased competition could have a negative impact on the economic performance of the buyers and processors in this category, and cause them to adjust their processing patterns.

4.7.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 are used to evaluate the effects of the alternatives.

Quantitative significance thresholds are inappropriate because of the absence of data and models. Instead, qualitative judgments as to the significance of effects will be made.

4.7.1.3 Methods, Models, and Data Sets

Available literature, together with expert opinion and other pertinent information, will play a critical role in the analysis of each criterion.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.7.2 through 4.7.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.8 Recreational Harvesters

4.8.1 Analytical Framework for the Assessment of Effects on Recreational Harvests

As indicated in Section 3.9, recreational harvesters of groundfish may be indirectly affected by a trawl IFQ program. Perhaps the most significant way in which recreational harvesters could be affected is through in the political balance of power in the fishery management process. If trawl groundfish harvesters and processors become more profitable under a trawl IFQ program, their level of participation and influence in Council and NMFS management processes may increase. This additional participation could ultimately result in increased constraints on the growth potential of the recreation fisheries. This is particularly true if the IFQ Program leads to permanent sector allocations for the trawl groundfish fishery. Finally, the need to for trawl harvester to reduce incidental catch rates of overfished species and consolidation may affect geographic distribution of trawl vessels and the number of trawl groundfish vessels on the ground.

4.8.1.1 Impacts, Mechanisms, and Condition Indicators for Recreational Harvesters of Groundfish

The assessment indirect impacts of the trawl IFQ program on recreational harvests will primarily be qualitative in nature, but will also based in part of changes projected for the alternatives for trawl groundfish harvesters and processors. Table 4-11 summarizes the Impact mechanisms, potential impacts, indicators or measurement criteria and significance thresholds for the effects of the alternative under the alternatives.

Table 4-11. Impact Mechanisms, Indicators and Significance Thresholds for Recreational Harvesters

Impact Mechanisms	Potential Impacts	Indicators / Measurement Criteria	Significance Threshold
Increased profitability of trawl harvesters and processors under IFQs	Change in Political Power	Projected trawl sector profits	+/- 20 percent
Permanent to allocation trawl sector	Limitations on recreational fishing growth	Future apportionment s of OYs to recreational sector the trawl groundfish sector.	Any permanent limit on growth would be deemed significant.
Trawl harvester need to reduce incidental catch, consolidation	Crowding of fishing grounds	Projections of number of trawl groundfish vessels	+/- 20 percent
		Projections of geographic distribution of harvests	+/- 20 percent shift in trawl distributions

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.6.1.2 through 4.6.1.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.9 Communities

4.9.1 Analytical Framework for the Assessment of Effects on Communities

Table 4-12 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-12. Overview of Analytical Approach Used to Compare Baseline and Future Conditions of Communities under the Alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Change in Vessels/Permits from Community	Consolidation of harvest operations; changes in distribution of harvest operations	Number of active vessels	Vessel count	+/-20% Change
		Number of permit holders	Permit data	+/- 20% Change
Change in Processing in Community	Consolidation of processing operations; changes in distribution of processing operations	Number of active processors	Output from sector analysis	+/- 20% Change
Change in Employment by Sector in Community	Consolidation and change in geographic distribution of sectors	Estimated number of jobs per sector	Output from sector analysis	+/- 20% Change
Change in Income in Community	Change in share based compensation structure for crew; loss of employment income through consolidation	Estimated income per sector	Output from sector analysis	+/- 20% Change
Change in Public Revenues in Community	Shift in geographic patterns of economic activity; changes in raw and processed product cost/value	Estimated revenues	Derived from output from sector analysis	+/- 20% Change
Change in Support Service Sector in Community	Changes in demand related to consolidation of fleet and processing as well as spatial and temporal redistribution of fishery related activity	Can be discussed in qualitative terms only.	Built on assumptions derived from sector analysis	Will not be able to derive quantitative threshold, will discuss qualitatively

4.9.1.1 Potential Impacts

The current economic deterioration of the West Coast groundfish trawl fishery would likely continue under the No-Action Alternative. This continuing deterioration would be a major concern for fishing communities that have a vital interest in the short-term and long-term economic viability of the fishery, the income and employment opportunities it provides, and the safety of participants in the fishery.

If the history of the implementation of other IFQ programs is a guide, the three IFQ alternatives (Alternatives 2 – 4) will result in social impacts being felt in a range of communities, as fewer vessels will participate in the fishery and fewer communities will be the sites of processing effort. In some ways, transition to an IFQ program could be viewed as neutral or a zero-sum exercise from an economic perspective, where presumably similar overall harvest levels will be sustained and potential losses in landings in one area (from a shift in distribution of effort), for example, would be offset by potential gains in landings elsewhere. From a social impact perspective, however, impacts result from at-risk and beneficiary populations or communities being different. Furthermore all things are not equal; there is intended to be an overall gain in value of the fishery with the transition to an IFQ system through an increase in efficiency and the increase in participant's ability to pursue value-added opportunities, among other program aspects. Again, if history is a guide, there will be fewer, if more stable, jobs across a range of sectors as efficiencies are increased and a redistribution of income and revenue opportunities will occur. The mechanisms that relate a trawl IFQ program to various potential social impacts are outlined in more detail below.

4.9.1.2 Impact Mechanisms

Vessel consolidation

- Employment: loss of skipper and crew positions
- Income: change in compensation structure
- Vessel related support service demand decline
- Vessel activity related public revenues decline

Processor consolidation

- Employment and income changes for processing employees
- Processing activity related support service demand changes
- Processing activity related public revenue changes

Changes in spatial distribution of effort

- Changes in the spatial distribution of vessel homeporting and/or other vessel activity or vessel related activity (including support service activity)
- Changes in the distribution of landing patterns
- Changes in the distribution of processing effort
- Changes in temporal distribution of effort
- Changes in timing and duration of harvester related activities
- Changes in timing and duration of processing related activities
- Changes in timing and duration of support services demand

Other economic changes

- Changes in price/value of raw and processed product(s) and therefore related revenue as seen on a localized basis
- Changes in vessel/processor ratios or other changes influencing shifting rent between sectors as seen on a localized basis

4.9.1.3 Measurement Criteria or Indicators

Measurement criteria or indicators are summarized in Table 4-12. These include estimated counts or values associated with the various indicators noted. As important as overall counts or absolute measurements, however, is the potential for redistribution between communities through changes in spatial distribution of effort, not necessarily associated with harvest activity itself, but through shifts brought about by consolidation and the pursuit of efficiency, which may favor particular communities or types of communities over others.

4.9.1.4 Models and Data

Information on likely numbers of harvesters and processors, and related derived measures, such as employment and income, will derive from information developed for the individual sectors as described in the previous sector profile sections of this document. These will then be applied to the community base.

Projections of change will not be made for each individual community. Patterns of redistribution accompanying or following consolidation, which will be important for the ultimate assessment of community impacts, will necessarily be described in qualitative terms, based in experience with previous IFQ programs as informed by the specific alternative attributes.

4.9.1.5 Significance Criteria or Thresholds

Consistent with the significance criteria utilized in the individual sector analyses, it is assumed that a 20 percent change in key indicators at the community level will be significant. Beyond individual sector changes, however, overall community level impact analysis will be driven by the combination of (a) direct fishery related changes and (b) community attributes of dependency and/or vulnerability. Further, indirect or cumulative impacts may prove significant in specific communities based on the combination of fishery engagement through direct participation and support service business participation. In the case of support service engagement, there are no standardized measures of community engagement or dependency, so there are no straightforward ways to establish quantitative thresholds of significance. Where quantitative thresholds are not of practical use, the significance of change will be discussed in terms of the nature, direction, and magnitude of likely impacts.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.9.2 through 4.9.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.10 Tribes

4.10.1 Analytical Framework for the Assessment of Effects on Tribes

As noted in the existing conditions section, tribal groundfish fisheries are regulated by the participating tribes themselves, with the type of overall allocations varying by groundfish species or species group. While not necessarily directly affected by Federal and state management measures, tribal entities are involved in the Council process and craft their groundfish management measures in cooperation with federal and state managers. Further, tribes and tribal related entities may be direct participants in the non-tribal fisheries subject to management under the proposed alternatives (as may any other entity) and it is known that at least some tribes are involved with fisheries support service business ventures that rely to at least some degree on potentially affected non-tribal fishing entities. Further, tribes may experience impacts resulting from capital spillover, fishing effort spillover, market competition, and processing related impacts. These factors will be addressed primarily in qualitative terms, as will potential impacts to the coastal distribution of fishing activity and potential changes in the distribution of income derived from fishing activities. Tribal comment will be needed during this process.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.10.2 through 4.10.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.11 Input Suppliers

4.11.1 Analytical Framework for the Assessment of Effects on Input Suppliers

As indicated in Section 3.12, input suppliers to the West Coast limited-entry trawl groundfish fishery may be indirectly affected by a trawl IFQ program. Businesses that supply inputs to groundfish trawl harvesters may be indirectly affected by a trawl IFQ program if the program causes behavioral changes in trawl groundfish harvesting operations. The Consulting Team's *a priori* expectation is that the indirect effects on input suppliers may not be as large as experienced in other IFQ programs because the race for fish in the West Coast groundfish trawl fishery has been virtually eliminated. However, because the implementation of IFQ programs in other fisheries around the world has had significant effects on input suppliers a careful examination of impacts is warranted.

Estimating impacts on input suppliers is complicated by the fact that many of the vessels and processors in the trawl groundfish sectors are not wholly dependent on the West Coast groundfish trawl fishery. Therefore, while a vessel may exit the West Coast groundfish trawl fishery it may remain active in other fisheries and continue to purchase a similar level of fixed or annual inputs. To simplify the analysis, it is assumed here that the only inputs that would be affected by a trawl IFQ program are those related to a vessel's level of fishing production, i.e., variable inputs.

The initial list[34] of variable inputs of trawl vessels that are likely to be affected by the alternatives include fuel, food, trawl gear, and observers.[35] For example, fuel expenditures are among the largest expense categories for fishing vessels. Under a trawl IFQ program, fish harvesters are expected to be better able to optimize their fishing activities over the course of the year, thereby decreasing fuel expenditures. As a result, marine fuel suppliers are likely to see a change in the demand for their product.

If there is considerable consolidation of the fleet, fewer trawl gear sets would be needed. On the other hand, consolidation would also mean that the gear on the vessels remaining in the fishery will see greater use during the year. Finally, if the remaining trawl harvesters become more profitable under a trawl IFQ program, they are more likely to replace and upgrade their gear more often.

[34] It could be argued that other inputs would be affected by a trawl IFQ program. This initial list could be augmented if it is determined that the use of other inputs may change significantly.

[35] Observers are included in this section because firms that provide observers are properly considered input suppliers. Inclusion of observers in this section does not imply that vessels would or would not be required to pay for observer coverage.

While fixed inputs are assumed to be unaffected by a trawl IFQ program, it is likely that a program would create new demands for the services of permit and QS brokers, and therefore effects on these input suppliers are included.

4.11.1.1 Impacts, Mechanisms, and Condition Indicators for Recreational Harvesters of Groundfish

Indicators of the effects of the alternative on input suppliers include but are not necessarily limited to the following:

- Fuel sales to trawl groundfish harvesters
- Estimated food sales to trawl groundfish harvesters
- Estimated annual sales of trawl gear in the West Coast groundfish trawl fishery
- Observer expenses, observer counts, and geographic distribution of observer supply businesses.

The assessment of indirect impacts of the trawl IFQ program on input suppliers will be based primarily on projected changes in the trawl groundfish catcher vessel classes. Because total vessel-level expenditures for the entire West Coast are unknown, it will not be possible to fully quantify impacts. Table 4-16 summarizes the Impact mechanisms, potential impacts, indicators or measurement criteria and significance thresholds for the effects of the alternative under the alternatives. Because the input suppliers for food, fuel are presumed to supply these input to both trawl and non-trawl, and recreational vehicle, the significant threshold used for these input is set at +/- 50 percent. Therefore if a supplier generates 40 percent of its revenue from trawl groundfish harvesters, then a 50 percent reduction in trawl expenditure would result in a 20 percent overall decline in revenue, which would be considered significant. Trawl gear suppliers may be more specialized and more dependent on the trawl fishery, and therefore the significant threshold is set at 20 percent. Similarly observer suppliers and permit brokers are likely to be more dependent on the trawl fishery and therefore a lower threshold may be reasonable.

Table 4-13. Impact Mechanisms, Indicators and Significance Thresholds for Input Suppliers under the Alternatives.

Impact Mechanisms	Potential Impacts	Indicators / Measurement Criteria	Significance Threshold
Consolidation, the profit motive, and the need to reduce incidental catches	Reduction total number of trips reduction in total days fished and increases in CPUE for target species.	Fuel expenditures	+/- 50 percent
		Food expenditures	+/- 50 percent
Consolidation	Reduction in the number of trawl vessels	Trawl gear expenditures	+/- 20 percent
The requirement for 100 percent monitoring	Increase in the number of observer days	Expenditures on Observers	+/- 20 percent
The initial allocation and transferability	Transfers of QS and QP and cumulative trip limits	Ex-vessel value of transfers	+/- 20 percent
Consolidation, the profit motive, and the need to reduce incidental catches	Geographic re-distribution of expenditures	Geographic distribution of permit holders remaining in the fishery	Qualitative judgment of the analysts

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.11.2 through 4.11.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.12 Wholesalers and Retailers

4.12.1 Analytical Framework for the Assessment of Effects on Wholesalers and Retailers

Wholesale and retail suppliers of groundfish would be indirectly affected by a trawl IFQ program to the extent that there are changes in groundfish product variety and groundfish product flows generated by trawl groundfish processors. Wholesale and retail suppliers will also be affected to the extent that the individual firms within the in sector directly benefit from the IFQ program, i.e. vertically integrated firms.

The implementation of IFQ programs in other fisheries around the world has created significant changes in the timing of harvests and types of products generated, but most of those fisheries were characterized by a race for fish management regime. These impacts are less likely in the West Coast groundfish trawl fishery because the fishery does not currently experience a race for fish—cumulative trip limits spread harvests out over time, thereby generally preventing market gluts. It is possible, however, that a trawl IFQ program would create incentives to decrease the period over which the harvest of a particular species take place, and therefore would lead to greater variances in product flow.

It is also possible that wholesalers and retailers, that are also trawl groundfish buyers and processors, may have be able to increase their relative market share because that may experience greater certainty of supplies and increasing profits. Therefore potential effects will report, to the extent possible, on integrated and non-integrated firms.

- Change in total wholesale value of non-integrated wholesalers and retailers
- Change in total wholesale value of integrated wholesalers and retailers
- Estimated market share of non-integrated wholesalers and retailers
- Estimated market share of integrated wholesalers and retailers

Data documenting the activities of wholesalers and retailers with respect to trawl groundfish are not known to exist, nor are reliable comprehensive data on wholesale or retail values. Therefore, the assessment of effects on wholesalers and retailers of trawl groundfish will be largely qualitative, relying largely on key informant interviews, and secondary data.

Table 4-14 shows the impact mechanisms, potential impacts, indicators and significance thresholds for of the effects of the alternatives on wholesalers and retailers.

Table 4-14. Impact Mechanisms, Indicators and Significance Thresholds for Wholesalers and Retailers under the Alternatives

Impact Mechanisms	Potential Impacts	Indicators / Measurement Criteria	Significance Threshold
Initial allocation rules, profit motive, reduction in incidental catch rates, greater utilization of target species, increased certainty and flexibility of harvesters and processors.	Creation of new products and changes in timing of production	Change in wholesale value of integrated firms	Qualitative judgment of analysts
		Change in wholesale value of non-integrated firms	Qualitative judgment of analysts
Initial allocation rules, profit motive	Reduction in competition	Market share of non-integrated firms	Qualitative judgment of analysts
		Market share non-integrated firms	Qualitative judgment of analysts

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.12.2 through 4.12.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.13 Consumers

4.13.1 Analytical Framework for the Assessment of Effects on Consumers

Consumers of West Coast trawl groundfish may be indirectly affected by a trawl IFQ program if the prices, quality or availability of groundfish products change. Currently cumulative trip limits in the West Coast groundfish trawl fishery already spread out harvests and allow processors to provide a wide variety of products to meet consumer demand. Therefore, the impacts of a trawl IFQ program on the market for trawl groundfish may be minimal.

Indicators of the effects of the alternatives on the consumer market for trawl groundfish include the following:

- Changes in product types and amounts by species group
- Changes in retail product prices by product type and species group

Comprehensive data documenting the consumer market for West Coast trawl groundfish are not known to exist. Therefore, the description of the effects on the consumer market will largely qualitative, and will rely largely on key informant interviews, secondary data, and the judgment of the analysts

Table 4-15. Impact Mechanisms, Indicators, and Significance Thresholds for Consumers

Impact Mechanisms	Potential Impacts	Indicators / Measurement Criteria	Significance Threshold
Initial allocation rules, profit motive, greater utilization of target species OYs.	Creation of new products and changes in timing of production	Product types and amounts by species group	Qualitative judgment of analysts
		retail product prices by product type by species group	Qualitative judgment of analysts
		Total estimated retail value of products	Qualitative judgment of analysts

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.13.2 through 4.13.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.14 General Public

4.14.1 Analytical Framework for the Assessment of Effects on the General Public

Table 4-16 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-16. Impact Mechanisms, Indicators, and Significance Thresholds for the General Public

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in non-consumptive and non-use benefits	Change in the level of fishery waste and the conditions of marine ecosystems and associated species that have non-consumptive or non-use value	Discards Condition of overfished groundfish species Condition of potentially affected marine mammals, seabirds, other protected species, habitat, and predator-prey relationships	Impact analysis in this document for pertinent resource groups	No quantitative threshold available; will discuss qualitatively in terms of the direction and degree of change

4.14.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool would continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. Reporting of at-sea discards of groundfish would not be required, and uncertainties about the accuracy of bycatch estimation are likely to continue. As a consequence, members of fishing fleets will continue to place pressure on managers to be less conservative in their estimates of bycatch. The management regime would remain unresponsive to the wide variety of fishing business strategies and operational concerns. The inflexibility of this system limits the ability of individual vessels to do everything possible to reduce waste, discard, and collateral damage to marine plants and animals that have non-consumptive or non-use value.

Implementation of an IFQ system under Alternatives 2 - 4 may cause fishermen to change behavior in a way that could affect the level of waste in the West Coast groundfish trawl fishery and the impact of the fishery on marine ecosystems and associated species: fishermen could change the level of fishing effort they employ, the areas they fish, the time of year they fish, and/or the gear with which they fish. Under Alternative 5, permit stacking will allow the creation of larger limits and provide greater flexibility to harvesters, with the end product being possible changes in time and area of fishing.

4.14.1.2 Measurement Criteria and Significance Criteria

No quantitative significance thresholds are available for changes in the non-consumptive and non-use benefits derived from marine ecosystems and associated species of concern. Instead, qualitative judgments as to the significance of effects are made after considering information regarding impacts on 1) discards; 2) overfished groundfish species; and 3) marine mammals, seabirds, other protected species, habitat, and predator-prey relationships .

4.14.1.3 Methods, Models, and Data Sets

Directly measuring changes in individuals' non-consumptive and non-use values for potentially affected marine ecosystems under each alternative is beyond the scope of this analysis. Therefore, the direction and degree of change of selected indicators defined in other sections of the analysis are considered as proxy metrics for the non-consumptive and non-use benefits that the general public derives from marine ecosystems and associated species of concern. In general, it is assumed that positive changes in the status of marine ecosystem and associated species positively affect the flow of non-consumptive and non-use benefits.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.14.2 through 4.14.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.15 Management Agencies

4.15.1.1 Analytical Framework for the Assessment of Effects on Management Agencies

Table 4-17 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-17. Impact Mechanisms, Indicators, and Significance Thresholds for Management Agencies

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in cost-effectiveness of fisheries management	Modification to procedures used to manage the fishery	Management costs	Agency records, various federal and state reports, discussions with NMFS staff	+/- 20% change
		Enforcement feasibility		Level of change to existing program required
		Reliability of fishery data		Degree of modifications required to existing system
		Risk to the resources		Level of management system change required to ensure that fishery catch caps are exceeded

4.15.1.2 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool would continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. Reporting of at-sea discards of groundfish would not be required, and uncertainties about the accuracy of bycatch estimation are likely to continue.

The three IFQ alternatives (Alternatives 2 – 4) represent a significant departure from the way the West Coast groundfish trawl fishery has been managed and operated. There are four key operational elements associated with an IQ program: initial issuance of quota, appeals process, quota tracking and catch monitoring. Costs associated with initial issuance will depend upon the number of people or entities issued quota shares, the number of species and area specific allocations, and the availability of complete and accurate historical catch records. The cost of processing appeals will be dependent up the complexity of the initial allocation determination process, the numbers of involved parties and the quality of historical catch records. Quota share tracking involves, for example, monitoring individual harvest quota usage and quota transfers. The current catch monitoring system may require modification to ensure proper functioning of the program. For example, an electronic fish ticket system may provide a faster transmission of data to NMFS allowing for quicker updating of individual quota holdings and, therefore, greater flexibility for fishermen to transfer quota as needed. An observer program is a critical component of a catch monitoring system. In general, these programs are expensive and difficult to operate. However, they provide a way to monitor total removals. Well defined goals and objectives are critical prerequisites of an effective IFQ program. They will facilitate development of the design and operational characteristics of the program.

4.15.1.3 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 are used to evaluate the effects of the alternatives.

4.15.1.4 Methods, Models, and Data Sets

To facilitate analysis of the three IFQ alternatives (Alternatives 2 – 4), it will be necessary to contact the NOAA Fisheries Northwest Regional Office to determine the extent of work that already has been initiated. In addition to management costs, it will be necessary to examine enforcement, data reliability and resource risk issues. Observer/monitoring system costs will be a critical issue in the analysis.

Under Alternative 5, all enforcement, monitoring, catch accounting and observer coverage levels are assumed to be equivalent to those under the No-Action Alternative. In will be necessary to determine the nature of program changes that will be needed to accommodate permit stacking. Once these changes are identified, it will be possible to examine impacts associated with such a change. How the remaining effects will be affected by this alternative will be determined by consulting with agency staff.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.15.2 through 4.15.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.16 Groundfish Resources

4.16.1 Analytical Framework for the Assessment of Effects on Groundfish Resources

Table 4-18 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-18. Impact Mechanisms, Indicators, and Significance Thresholds for Groundfish Resources

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in the capacity of a stock to produce MSY on a continuing basis and in the sustainability of a stock	Flexibility of fishermen in selecting the level of fishing effort they employ, the area they fish, the time of year they fish, and the gear with which they fish	Fishing mortality	Available literature, including the FMP, recent stock assessments, and EISs, together with expert opinion, and other pertinent information will play a critical role in the analysis of each criterion	Relation to overfishing mortality rate
		Biomass level		Stock size relative to maximum stock size threshold (MSST)
		Spatial/temporal concentration of catch		Stock size relative to maximum stock size threshold (MSST)
		Prey availability		Stock size relative to maximum stock size threshold (MSST)
		Habitat suitability		Stock size relative to maximum stock size threshold (MSST)

4.16.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool would continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. Reporting of at-sea discards of groundfish would not be required, and uncertainties about the accuracy of bycatch estimation are likely to continue. As a consequence, members of fishing fleets will continue to place pressure on managers to be less conservative in their estimates of bycatch. The management regime would remain unresponsive to the wide variety of fishing business strategies and operational concerns. Under this system, there is little direct incentive for individual vessels to do everything possible to avoid take of species for which there are conservation concerns, such as overfished species.

The most significant impact of the three IFQ alternatives (Alternatives 2 - 4) on the capacity of target species or related species group(s) to produce maximum sustainable yield (MSY) on a continuing basis and on the sustainability of these stocks results from the flexibility that can be exercised in the use of quota shares. Under these alternatives, quota share holders may have greater freedom in determining the level of fishing effort to employ, selecting the area where to fish, picking the time during the year to fish, and choosing the gear with which they fish. During 2002 and 2003, the fishery was characterized by a significant under harvest of available catch quota for many species. A major factor contributing to this phenomenon was the small catch caps for some groundfish species. The ability to adjust operations to current conditions should reduce the number of under harvested species.
Under Alternative 5, permit stacking will allow the creation of larger limits. These larger limits will provide greater flexibility to harvesters, with the end product being possible reductions in incidental catch levels.

4.16.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 will be used to evaluate the effects of the alternatives.

The significance of the effects the are likely to surface as a result of implementation of the alternatives being considered are evaluated as to whether the impacts may be reasonably expected to jeopardize the sustainability of each target species or related species group(s).

Overfishing and stock size thresholds have been developed for key groundfish species. These thresholds are used to evaluate the significance of the effects of the alternative management actions. Fishing mortality rates that exceed the overfishing mortality rate are considered to jeopardize the capacity of the stock to produce MSY on a continuing basis and adversely impact the sustainability of the stock. A related measure of this potential is indicated by change in biomass levels. The significance of effects of the spatial/temporal concentration of the catch, the level of prey availability, and habitat suitability for target species is evaluated with respect to each stock's size relative to its MSST. An action that jeopardizes the stock's ability to sustain itself at or above its MSST is considered to adversely affect the sustainability of the stock. Species or species complexes that do not have reliable estimates of MSST cannot be evaluated for the significance of these effects.

4.16.1.3 Methods, Models, and Data Sets

Information developed in other sections of this EIS, mainly that dealing with predicted changes in fishing practices, will provide insight into how the operation of the fishery might change under the alternatives. Once this information is available, it will be possible to examine each criterion in Table 4-18. Available literature, including the FMP, recent stock assessments, EISs, together with expert opinion and other pertinent information will play a critical role in the analysis of each criterion in the table.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.16.2 through 4.16.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.17 Other Fish Resources

4.17.1 Analytical Framework for the Assessment of Effects on Other Fish Resources

Table 4-19 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-19. Impact Mechanisms, Indicators, and Significance Thresholds for Other Fish Resources

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in the sustainability of a stock	Flexibility of fishermen in selecting the level of fishing effort they employ, the area they fish, the time of year they fish, and the gear with which they fish	Fishing mortality	Available literature, including the FMP, recent stock assessments, and EISs, together with expert opinion, and other pertinent information will play a critical role in the analysis of each criterion	Level of mortality
		Biomass level		Stock size relative to Maximum sustainable yield biomass
		Spatial/temporal concentration of catch		Stock size relative to maximum stock size threshold (MSST)
		Prey availability		Availability relative to historical levels
		Habitat suitability		Level of damage relative to historical levels

4.17.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool would continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. Reporting of at-sea discards of groundfish would not be required, and uncertainties about the accuracy of bycatch estimation are likely to continue. As a consequence, members of fishing fleets will continue to place pressure on managers to be less conservative in their estimates of bycatch. The management regime would remain unresponsive to the wide variety of fishing business strategies and operational concerns. The inflexibility of this system limits the ability of individual vessels to do everything possible to avoid take of species in this resource category.

The most significant impact of the three IFQ alternatives (Alternatives 2 - 4) on the sustainability of Other Fish Resources results from the flexibility that can be exercised in the use of quota shares. Under these alternatives, quota share holders may have greater freedom in determining the level of fishing effort to employ, selecting the area where to fish, picking the time during the year to fish, and choosing the gear with which they fish. With the ability to change fishing operations, the bycatch of species in this category should go down in the West Coast groundfish trawl fishery. The enhanced fishery monitoring will allow improvement in the documentation of the bycatch of these species which will facilitate management of the fishery.

Under Alternative 5, permit stacking will allow quota share holders to increase the size of their limits. This should make it possible to reduce the bycatch of species in this resource category.

4.17.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 are used to evaluate the effects of the alternatives.

Significance of effects is based on the likelihood that population-level changes will result from internal events within the groundfish fishery. An effect that is considered not significant corresponds to a change that is not likely to result in population-level effects on these resources or that lies within the range of natural variability for the species.

4.17.1.3 Methods, Models, and Data Sets

Information developed in other sections of this EIS, mainly that dealing with predicted changes in fishing practices, will provide insight into how the operation of the fishery might change under the alternatives. Once this information is available, it will be possible to examine each criterion in Table 4-19. Available literature, including the FMP, recent stock assessments, EISs, together with expert opinion and other pertinent information will play a critical role in the analysis of each criterion in the table.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.17.2 through 4.17.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.18 Marine Mammals

4.18.1 Analytical Framework for the Assessment of Effects on Marine Mammals

Table 4-20 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-20. Impact Mechanisms, Indicators, and Significance Thresholds for Marine Mammals under the Alternatives

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in the reproduction and/or survival of a marine mammal species group in a way that could affect the population	Flexibility of fishermen in selecting the level of fishing effort they employ, the area they fish, the time of year they fish, and the gear with which they fish	Incidental take/entanglement in marine debris	Available literature, including the FMP, recent stock assessments, and EISs, together with expert opinion, and other pertinent information will play a critical role in the analysis of each criterion	Stock size or recovery time
		Harvest of prey species		Foraging success
		Spatial/temporal concentration of fishery		Survival and/or reproductive success
		Disturbance		Survival and/or reproductive success

4.18.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool would continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. The management regime would remain unresponsive to the wide variety of fishing business strategies and operational concerns. The inflexibility of this system limits the ability of individual vessels to do everything possible to avoid interactions with marine mammals.

The most significant impact of the three IFQ alternatives (Alternatives 2 - 4) on the reproduction and/or survival of marine mammal species groups results from the flexibility that can be exercised in the use of quota shares. Under these alternatives, quota share holders may have greater freedom in determining the level of fishing effort to employ, selecting the area where to fish, picking the time during the year to fish, and choosing the gear with which they fish. With the ability to change fishing operations, the probability of negative fishery/marine mammal interactions should go down. The enhanced fishery monitoring will allow improvement in the documentation of fishery/marine mammal interactions which will facilitate management of the fishery.

Under Alternative 5, permit stacking will allow quota share holders to increase the size of their catch limits. This should make it possible for quota share holders to adjust their fishing activities to reduce the probability of negative fishery/marine mammal interactions.

4.18.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 are used to evaluate the effects of the alternatives.

Potential effects of the alternatives would be estimated in light of the extent of direct take, disturbance by fishing vessels, and competition between the fisheries and marine mammals for food. Two issues to be explored are: 1) do these effects occur or could they occur under each alternative, and 2) if they do occur, do they occur to an extent that would limit the recovery of a listed species or adversely modify critical habitat. If these effects do occur to an extent that would limit the recovery of a listed species or adversely modify critical habitat, then it would be concluded that the action would have significant effects under NEPA. If these effects do not occur or are insignificant under the ESA, then it is concluded that the action would have no significant effects for the purpose of NEPA.

4.18.1.3 Methods, Models, and Data Sets

Information developed in other sections of this EIS, mainly that dealing with predicted changes in fishing practices, will provide insight into how the operation of the fishery might change under the alternatives. Once this information is available, it will be possible to examine each criterion in Table 4-20. Available literature, including the FMP, recent stock assessments, EISs, together with expert opinion and other pertinent information will play a critical role in the analysis of each criterion in the table.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.18.2 through 4.18.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.19 Seabirds

4.19.1 Analytical Framework for the Assessment of Effects on Seabirds

Table 4-21 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-21. Impact Mechanisms, Indicators, and Significance Thresholds for Seabirds under the Alternatives

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in the population trends of species outside the range of natural fluctuations	Flexibility of fishermen in selecting the level of fishing effort they employ, the area they fish, the time of year they fish, and the gear with which they fish	Incidental take in gear and vessel strikes	Available literature, including the FMP, recent stock assessments, and EISs, together with expert opinion, and other pertinent information will play a critical role in the analysis of each criterion	Level of take relative to population level
		Prey availability and fishery wastes		Survival or reproductive success
		Benthic habitat		Survival or reproductive success

4.19.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool would continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. The management regime would remain unresponsive to the wide variety of fishing business strategies and operational concerns. The inflexibility of this system limits the ability of individual vessels to do everything possible to avoid interactions with seabirds.

The most significant impact of the three IFQ alternatives (Alternatives 2 - 4) on the population trends of seabirds results from the flexibility that can be exercised in the use of quota shares. Under these alternatives, quota share holders may have greater freedom in determining the level of fishing effort to employ, selecting the area where to fish, picking the time during the year to fish, and choosing the gear with which they fish. With the ability to change fishing operations, the probability of negative fishery/seabird interactions should go down. The enhanced fishery monitoring will allow improvement in the documentation of fishery/seabird interactions which will facilitate management of the fishery.

Under Alternative 5, permit stacking will allow quota share holders to increase the size of their catch limits. This should make it possible for quota share holders to adjust their fishing activities to reduce the probability of negative fishery/seabird interactions.

4.19.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 will be used to evaluate the effects of the alternatives.

Significance criteria for impacts on seabirds are based on whether the proposed action would be likely to result in population level effects, defined as changes in the population trend outside the range of natural fluctuations. There are a large number of unpredictable variables and gaps in current knowledge about particular species and ecosystem effects. Therefore, it is impossible to ascertain significance on a strictly quantitative basis.

Except for the supplemental food provided by fisheries in the form of offal, the effects of them are considered adverse to individual birds. Low levels of incidental take of seabirds are better for conservation purposes than high levels of take, but no amount of incidental take can be considered beneficial to a seabird population.

4.19.1.3 Methods, Models, and Data Sets

Information developed in other sections of this EIS, mainly that dealing with predicted changes in fishing practices, will provide insight into how the operation of the fishery might change under the alternatives. Once this information is available, it will be possible to examine each criterion in Table 4-21. Available literature, including the FMP, recent stock assessments, EISs, together with expert opinion and other pertinent information will play a critical role in the analysis of each criterion in the table.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.19.2 through 4.19.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.20 Other Protected Resources

4.20.1 Analytical Framework for the Assessment of Effects on Other Protected Resources

Table 4-22 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-22. Impact Mechanisms, Indicators, and Significance Thresholds for Other Protected Resources

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in the sustainability of a stock	Flexibility of fishermen in selecting the level of fishing effort they employ, the area they fish, the time of year they fish, and the gear with which they fish	Level of fishing effort and fishery interactions Spatial/temporal characteristic of catch Prey availability Habitat suitability	Available literature, including the FMP, recent stock assessments, and EISs, together with expert opinion, and other pertinent information will play a critical role in the analysis of each criterion	Stock size relative to historical levels

4.20.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool would continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. The management regime would remain unresponsive to the wide variety of fishing business strategies and operational concerns. The inflexibility of this system limits the ability of individual vessels to do everything possible to avoid interactions with protected species.

The most significant impact of the three IFQ alternatives (Alternatives 2 - 4) on the stock status of Other Protected Resources results from the flexibility that can be exercised in the use of quota shares. Under these alternatives, quota share holders may have greater freedom in determining the level of fishing effort to employ, selecting the area where to fish, picking the time during the year to fish, and choosing the gear with which they fish. With the ability to change fishing operations, the probability of negative fishery/Other Protected Resources interactions should go down. The enhanced fishery monitoring will allow improvement in the documentation of fishery/Other Protected Resources interactions which will facilitate management of the fishery.

Under Alternative 5, permit stacking will allow quota share holders to increase the size of their catch limits. This should make it possible for quota share holders to adjust their fishing activities to reduce the probability of negative fishery/Other Protected Resources interactions.

4.20.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 are used to evaluate the effects of the alternatives.

The significance of these effects is evaluated as to whether the impacts of the proposed action may be reasonably expected to jeopardize the sustainability of each species or species group or its ability to recover over time.

4.20.1.3 Methods, Models, and Data Sets

Information developed in other sections of this EIS, mainly that dealing with predicted changes in fishing practices, will provide insight into how the operation of the fishery might change under the alternatives. Once this information is available, it will be possible to examine each criterion in Table 4-22. Available literature, including the FMP, recent stock assessments, EISs, together with expert opinion and other pertinent information will play a critical role in the analysis of each criterion in the table.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.20.2 through 4.20.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.21 Habitat

4.21.1 Analytical Framework for the Assessment of Effects on Habitat

Table 4-23 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-23. Impact Mechanisms, Indicators, and Significance Thresholds for Habitat under the Alternatives

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in adverse impacts on habitat	Flexibility of fishermen in selecting the level of fishing effort they employ, the area they fish, the time of year they fish, and the gear with which they fish	Amount of gear interactions with habitat by gear Location of interactions with habitat Habitat type affected	Habitat database; interviews to determine changes in time, area, and gear; and available literature, including the FMP, recent stock assessments, and EISs, together with expert opinion, and other pertinent information	+/-20% change or discuss qualitatively in terms of the direction and degree of change

4.21.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool will continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. Trawl fishermen currently affect habitat through gear interactions. Little information has been developed for assessing gear impacts on habitat and fish production associated with habitat. The EFH EIS presents conclusions that trawl gear has greater adverse impacts on biogenic structure and vertical relief than on unconsolidated sediments, especially in high energy environments. Fishermen have little flexibility to change fishing behavior, because doing so would result in additional costs or reduced benefits, given market demands for fish. However, management actions under Amendments 18-19 that implement trawl gear restrictions and time-area closures will reduce adverse impacts from fishing on habitat.

Alternatives 2 - 5 will not directly affect habitat or regulations that manage habitat. However, implementation of an IFQ system under Alternatives 2 - 4 may cause fishermen to change behavior in a way that could affect habitat: fishermen could change the level of fishing effort they employ, the areas they fish, the time of year they fish, and/or the gear with which they fish. Under Alternative 5, permit stacking will allow the creation of larger limits and provide greater flexibility to harvesters, with the end product being possible changes in time and area of fishing. Permit stacking would not allow fishers to change gear. Changes in the fishing practices of particular sectors as a result of an IFQ program or permit stacking could indirectly affect the condition of habitat.

4.21.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 will be used to evaluate the effects of the alternatives. Whether evaluation of significance criteria can occur with quantitative or qualitative analysis will depend on the level of detail of information provided by respondents during interviews (see Section 4.1.7.1).

4.21.1.3 Methods, Models, and Data Sets

As described in Section 4.1.7.1, for each alternative, interview respondents would predict changes in fishing practices: e.g., changes in gear type or configuration; changes in area(s) fished; and changes in fishing effort in area(s) or season. The analysis would examine predicted responses resulting from each alternative relative to the known habitat. For example, if analysis of interviews predicts that a proportion of fishermen will move from a current to a new location for some proportion of the time, new maps of fishing activities would show reduced fishing effort in current areas and increased effort in new areas. Queries of the GIS database would indicate whether the changes in area would translate into changes in distribution of fishing effort on habitat types.

If interviews demonstrate that little change from baseline fishing practices will occur for particular sectors as a result of an IFQ system, little further analysis of fishing impacts on habitat will be required.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.21.2 through 4.21.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

4.22 Trophic Relationships

4.22.1 Analytical Framework for the Assessment of Effects on Trophic Relationships

Table 4-24 provides an overview of 1) potential impacts; 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact; 4) models and data sets used in the analysis; and 5) significance criteria or thresholds.

Table 4-24. Impact Mechanisms, Indicators, and Significance Thresholds for Trophic Relationships

Potential Impacts	Impact Mechanisms	Measurement Criteria	Source Data	Significance Criteria
Changes in ecological functions of predators and prey	Flexibility of fishermen in selecting the level of fishing effort they employ, the area they fish, the time of year they fish, and the gear with which they fish	Predator abundance Prey abundance Average trophic level	Habitat database; interviews to determine changes in time, area, and gear; and available literature, including the FMP, recent stock assessments, and EISs, together with expert opinion, and other pertinent information	No quantitative threshold available; will discuss qualitatively in terms of the direction and degree of change

4.22.1.1 Potential Impacts and Impact Mechanisms

Under the No-Action Alternative, the primary management tool will continue to be two-month cumulative landings limits available to vessels with limited entry trawl permits. Trawl fishermen currently affect trophic interactions through adverse impacts on habitat that may affect production of predators and prey, through catch of predators and prey that species composition and relative abundance, and through changes in bio-energetic flow resulting from discards that redistributes food items (e.g., benthic resources redistributed to surface and midwater zones). Little information has been developed for assessing gear impacts on trophic interactions, although the EFH EIS presents summaries on information known for some predators and some prey. Fishermen have little flexibility to change fishing behavior, because doing so would result in additional costs or reduced benefits, given market demands for fish. However, management actions under Amendments 18-19 that implement trawl gear restrictions and time-area closures or change quantities of bycatch discarded could affect some aspects of trophic relationships.

Alternatives 2 - 5 will not directly affect trophic relationships. However, implementation of an IFQ system under Alternatives 2 - 4 may cause fishermen to change behavior in a way that could affect habitat: fishermen could change the level of fishing effort they employ, the areas they fish, the time of year they fish, and/or the gear with which they fish. Under Alternative 5, permit stacking will allow the creation of larger limits and provide greater flexibility to harvesters, with the end product being possible changes in time and area of fishing. Permit stacking would not allow fishers to change gear. Changes in the fishing practices of particular sectors as a result of an IFQ program or permit stacking could indirectly affect the condition of trophic relationships.

4.22.1.2 Measurement Criteria and Significance Criteria

The same measurement criteria used to describe historical and baseline conditions in Chapter 3 will be used to evaluate the effects of the alternatives.

No quantitative significance thresholds are available; qualitative judgments as to the direction and magnitude of effects will be made based on pertinent information and literature review.

4.22.1.3 Methods, Models, and Data Sets

As described in Section 4.1.7.1, for each alternative, respondents would predict changes in fishing practices: e.g., changes in gear type or configuration; changes in area(s) fished; and changes in fishing effort in area(s) or season. The analysis would examine predicted responses resulting from IFQ alternatives relative to the known suite of predator and prey species. For example, if analysis of interviews predicts that a proportion of fishermen would shift from trawls to other gears, the analysis could qualitatively assess the range and amount of species caught and the impact on predator-prey relationships.

If interviews demonstrate that little change from baseline fishing practices will occur for particular sectors as a result of an IFQ system, little further analysis of fishing impacts on trophic relationships will be required.

Two summary tables (not shown but similar to Table 4-4 and Table 4-5) will provide an overview of the indirect effect and cumulative effects of the alternatives. These table will be followed by Sections 4.22.2 through 4.22.6. These sections are not shown, but will be structured in a manner similar to Sections 4.3.2 through 4.3.6.

5 Summary of Other Environmental Management Issues

This chapter summarizes a range of environmental issues that are required under 40 CFR 1502.16. This CEQ regulation describes the analysis of environmental consequences required under an EIS. The discussion in this section follows the environmental impacts disclosed in Chapter 4.

5.1 Short-Term Uses versus Long-Term Productivity

Balancing short-term use and long-term productivity is the essence of fisheries management. Short-term uses generally affect the present quality of life for the public; while long-term productivity is based on environmental sustainability and concerns the quality of life of future generations. While harvest in any one year may or may not affect long-term productivity, harvests are part of an ongoing activity. Fishing over many years cumulatively affects productivity.

This action does not directly affect the process by which sustainable harvest levels are set or enforced. It may however help to improve catch monitoring and bycatch accounting in the groundfish trawl fishery. The proposed action may also indirectly affect the sustainability of marine resources by inducing change in fishing behavior including areas and times fished.

5.2 Irreversible Resource Commitments

A resource is irretrievably committed if its use is lost for a time, but is not actually or practically lost permanently. The analysis of direct, indirect, and cumulative impacts in this document generally addresses any irretrievable resource commitments. Assignment of fishing quotas to particular entities under some of the alternatives considered in this analysis may represent an irretrievable resource commitment, since the quota may be unavailable for use by other participants. Also, fish that are harvested represent an irretrievable resource commitment, as do the inputs in terms of capital and labor (including energy and resources) needed to harvest and market these fish. Nevertheless, these factors are not likely to be adversely affected by any of the alternatives considered in this document.

5.3 Energy Requirements and Conservation Potential of the Alternatives

The proposed action may indirectly affect energy use primarily in the form of fossil fuels used to power fishing vessels. Fuel consumption is likely to correlate with harvest levels, although this was not empirically tested as it is outside the scope of this action. Individual fishing quotas may actually conserve fossil fuel by allowing vessels increased flexibility in where and when to fish; although there are a variety of other factors that could affect overall energy use and efficient utilization. Changes in fuel prices, for example, could greatly affect the level of fishing vessel operations independent of the other regulatory factors under the alternatives.

5.4 Urban Quality, Historic Resources, and the Design of the Built Environment

Public investment in shoreside amenities and marine-related infrastructure such as docks, boat basins, jetties, and navigable channels, is sensitive to changes in tax revenue. By itself, changes in fishing-related revenue may not have an overwhelming impact on local tax revenues, but external factors such as changes in the broader economy could act cumulatively. It is also possible that as private investment shrinks so that, for example, there are fewer fishing vessels, there will be less political motivation to devote public resources to maintaining port infrastructure. Such changes could also affect cultural and historic resources as fishing and fishing-dependent activities are supplanted, changing the character of a coastal community. The effects described above are speculative. No direct impacts of the proposed action on cultural historic resources protected under the National Historical Preservation Act are expected. However further fleet consolidation, which is likely to occur in response to economic incentives under any of the alternatives, may indirectly affect the level of private and public investment in port infrastructure.

5.5 Possible Conflicts between the Proposed Action and Other Plans and Policies for the Affected Area

Groundfish species are caught incidentally in fisheries managed under other Council FMPs (e.g., salmon, coastal pelagic species, and highly migratory species). FMPs try to strike a balance between conservation and utilization and so generally include objectives related to resource use and capacity levels of the fishing fleet. Impacts of this action may affect these fisheries as a result of spillover if displaced groundfish vessels choose to pursue other fishing opportunities, and thus possibly come into conflict with some of the objectives of these FMPs.

5.6 Significant and Unavoidable Adverse Impacts

The EIS must include a discussion of those adverse effects that cannot be avoided (40 CFR 1502.16). This discussion focuses on potentially significant adverse impacts of the proposed action, as implemented by the different alternatives. CEQ regulations at 40 CFR 1508.27 define “significantly” in terms of both context and intensity, and provide ten factors to consider when evaluating the intensity of an impact. NOAA provides agency guidance in determining significant impacts of fishery management actions in administrative order NAO 216-6 at §6.02, which expands on the CEQ definition. These criteria focus on the components of the human environment most likely to be affected by these types of actions. Based on the guidance in these two sources, the proposed action could result in the following potentially significant impacts.

By itself, the proposed action does not have significant social or economic impacts interrelated with the potential significant natural or physical environmental effects discussed above (NAO 216-6 §6.02h). Changes in ex-vessel revenue and personal income are not anticipated to substantially change from levels estimated for the recent past and present.

CEQ regulations also state that “the degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about future consideration” (40 CFR 1508.27(b)(6)) should be part of the significance evaluation. Clearly if individual quotas are established for groundfish trawl catch there is likely to be pressure to extend a quota system to other groundfish and non-groundfish fisheries in the future.

5.7 Mitigation

An EIS must discuss “means to mitigate the adverse environmental impacts” stemming from the proposed action (40 CFR 1502.1(h)), even if the adverse impacts are not by themselves significant.

Potential mitigation measures are discussed with respect to the components of the human environment potentially affected by the proposed action.

Habitat and ecosystem: Although adverse impacts to overfished species' habitats may be caused by a range of natural events and human activities, mitigation measures within the scope of NMFS authority would address fishing-related impacts. For example, the existing system of RCAs would not be affected by this action, nor would the ongoing process to establish and manage groundfish EFH. The alternatives do include provisions to allow designation of area-specific fishing quotas, if necessary, to reduce the likelihood of local depletion of harvested fish stocks.

Bycatch reduction: Amendment 18 to the Groundfish FMP includes consideration of bycatch caps and individual fishing quotas. Effective bycatch monitoring will be an important basis for implementing these types of programs. A higher level of observer coverage than under the current WCGOP will likely be necessary. In addition to limiting total mortality, individual quota programs could provide incentives for fishermen to find ways to reduce bycatch rates, since they would more directly bear the cost and reap the benefits of managing their own bycatch.

Socioeconomic sectors: Adverse socioeconomic impacts may result from changes in the geographic distribution of commercial harvests and recreational fishing opportunities. The alternatives considered in this document include Community Stability Holdback provisions that would allow associations of quota holders to engage in cooperative fishing activities. This program is designed to at least partially protect communities from economic impacts of any adverse changes in the geographic distribution of fishing activity under an IFQ program.

6 Consistency with the IFQ program, West Coast Groundfish FMP and with MSA National Standards and Requirements

This section examines the consistency of the proposed action with the IFQ program goals, objectives, constraints and guiding principles, West Coast Groundfish FMP, national standards of the MSA and with other applicable requirements of the MSA.

6.1 Consistency with ITQ Project Goals, Objectives, Constraints and Guiding Principles

The ITQ program goals, objectives, constraints and guiding principles are described in Section 1.1.2. The relative performance of the proposed action with respect to these goals, objectives, and constraints and guiding principles is summarized in this section.

6.2 Consistency with FMP Goals and Objectives

The Groundfish FMP goals and objectives are described below, together with the way in which the proposed action addresses these objectives.

Management Goals.

Goal 1 - Conservation. Prevent overfishing and rebuild overfished stocks by managing for appropriate harvest levels, and prevent, to the extent practicable, any net loss of the habitat of living marine resources.

Goal 2 - Economics. Maximize the value of the groundfish resource as a whole.

Goal 3 - Utilization. Achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

Objectives. To accomplish these management goals, a number of objectives will be considered and followed as closely as practicable:

Conservation.

Objective 1. Maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.

Objective 2. Adopt harvest specifications and management measures consistent with resource stewardship responsibilities for each groundfish species or species group.

Objective 3. For species or species groups which are below the level necessary to produce MSY, consider rebuilding the stock to the MSY level and, if necessary, develop a plan to rebuild the stock.

Objective 4. Where conservation problems have been identified for non-groundfish species, and the best scientific information shows the groundfish fishery has a direct impact on the ability of that species to maintain its long-term reproductive health, the Council may consider establishing management measures to control the impacts of groundfish fishing on those species. Management measures may be imposed on the groundfish fishery to reduce fishing mortality of a non-groundfish species for documented conservation reasons. The action will be designed to minimize disruption of the groundfish fishery, in so far as consistent with the goal to minimize the bycatch of non-groundfish species, and will not preclude achievement of a quota, harvest guideline, or allocation of groundfish, if any, unless such action is required by other applicable law.

Objective 5. Describe and identify EFH, adverse impacts on EFH, and other actions to conserve and enhance EFH, and adopt management measures that minimize, to the extent practicable, adverse impacts from fishing on EFH.

Economics.

Objective 6. Attempt to achieve the greatest possible net economic benefit to the nation from the managed fisheries.

Objective 7. Identify those sectors of the groundfish fishery for which it is beneficial to promote year-round marketing opportunities and establish management policies that extend those sectors' fishing and marketing opportunities as long as practicable during the fishing year.

Objective 8. Gear restrictions to minimize the necessity for other management measures will be used whenever practicable.

Utilization.

Objective 9. Develop management measures and policies that foster and encourage full utilization (harvesting and processing) of the Pacific Coast groundfish resources by domestic fisheries.

Objective 10. Recognizing the multi-species nature of the fishery and establish a concept of managing by species and gear or by groups of interrelated species.

Objective 11. Strive to reduce the economic incentives and regulatory measures that lead to wastage of fish. Also, develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. In addition, promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve other information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

Objective 12. Provide for foreign participation in the fishery, consistent with the other goals to take that portion of the OY not utilized by domestic fisheries while minimizing conflict with domestic fisheries.

Social Factors.

Objective 13. When conservation actions are necessary to protect a stock or stock assemblage, attempt to develop management measures that will affect users equitably.

Objective 14. Minimize gear conflicts among resource users.

Objective 15. When considering alternative management measures to resolve an issue, choose the measure that best accomplishes the change with the least disruption of current domestic fishing practices, marketing procedures, and the environment.

Objective 16. Avoid unnecessary adverse impacts on small entities.

Objective 17. Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.

Objective 18. Promote the safety of human life at sea.

6.3 Consistency with MSA National Standards

An FMP or plan amendment and any pursuant regulations must be consistent with ten national standards contained in Sec. 301 of the MSA. The national standards are described below, together with the way in which the proposed action is consistent with these standards.

National Standard 1: Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

National Standard 2: Conservation and management measures shall be based on the best scientific information available.

National Standard 3: To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

National Standard 4: Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishers, such allocation shall be (A) fair and equitable to all such fishers; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges. The proposed measures will not discriminate between residents of different states.

National Standard 5: Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

National Standard 6: Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

National Standard 7: Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

National Standard 8: Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

National Standard 9: Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

National Standard 10: Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea

6.4 Consistency with MSA Requirements for a Limited Access System

Sec. 303(b)(6) of the MSA states that, in developing a limited access system for a fishery in order to achieve optimum yield, the Council and the Secretary shall take into account

(A) present participation in the fishery,

(B) historical fishing practices in, and dependence on, the fishery,

(C) the economics of the fishery,

(D) the capability of fishing vessels used in the fishery to engage in other fisheries,

(E) the cultural and social framework relevant to the fishery and any affected fishing communities, and

(F) any other relevant considerations.

6.5 Consistency with MSA Requirements for Individual Fishing Quotas

Sec. 303(d)(5) of the MSA states that, in submitting and approving any new individual fishing quota program on or after October 1, 2000, the Councils and the Secretary shall consider the report of the National Academy of Sciences required under section 108(f) of the Sustainable Fisheries Act, and any recommendations contained in such report, and shall ensure that any such program

(A) establishes procedures and requirements for the review and revision of the terms of any such program (including any revisions that may be necessary once a national policy with respect to individual fishing quota programs is implemented), and, if appropriate, for the renewal, reallocation, or reissuance of individual fishing quotas;

(B) provides for the effective enforcement and management of any such program, including adequate observer coverage, and for fees under section 304(d)(2) to recover actual costs directly related to such enforcement and management; and

(C) provides for a fair and equitable initial allocation of individual fishing quotas, prevents any person from acquiring an excessive share of the individual fishing quotas issued, and considers the allocation of a portion of the annual harvest in the fishery for entry level fishermen, small vessel owners, and crew members who do not hold or qualify for individual fishing quotas.

6.6 MSA Fishery Impact Statement

Sec. 303(a)(9) of the MSA requires any fishery management plan or amendment to include a fishery impact statement which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on--

(A) participants in the fisheries and fishing communities affected by the plan or amendment; and

(B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants.

Information for the fishery impact statement will be abstracted from the detailed information presented in Appendix B and the sector and community analysis presented in the main body of the EIS.

7 Cross-Cutting Mandates

This section examines the consistency of the proposed action with other applicable federal mandates.

7.1 Other Federal Laws

7.1.1 Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) of 1972 requires all federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The Council-preferred Alternative would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination has been submitted to the responsible state agencies for review under Section 307(c)(1) of the CZMA. The relationship of the groundfish FMP with the CZMA is discussed in Section 11.7.3 of the Groundfish FMP. The Groundfish FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs. The recommended action is consistent and within the scope of the actions contemplated under the framework FMP.

Under the CZMA, each state develops its own coastal zone management program which is then submitted for federal approval. This has resulted in programs which vary widely from one state to the next. The proposed action is not expected to affect any state's coastal management program.

7.1.2 Endangered Species Act

NMFS issued BOs under the ESA on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999 pertaining to the effects of the groundfish fishery on Chinook salmon (Puget Sound, Snake River spring/summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central Valley spring, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal), chum salmon (Hood Canal summer, Columbia River), sockeye salmon (Snake River, Ozette Lake), and steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, northern California, southern California). During the 2000 Pacific whiting season, the whiting fisheries exceeded the chinook bycatch amount specified in the Pacific whiting fishery BO (December 15, 1999) incidental take statement estimate of 11,000 fish, by approximately 500 fish. In the 2001 whiting season, however, the whiting fishery's chinook bycatch was about 7,000 fish, which approximates the long-term average. After reviewing data from, and management of, the 2000 and 2001 whiting fisheries (including industry bycatch minimization measures), the status of the affected listed chinook, environmental baseline information, and the incidental take statement from the 1999 whiting BO, NMFS determined in a letter dated April 25, 2002 that a re-initiation of the 1999 whiting BO was not required. NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. The proposed action is within the scope of these consultations.

The analysis of impacts to salmon (see Section 4.19.1.1 Other Fish Resources) and protected resources will be used to evaluate the consistency of the proposed action with the ESA.

7.1.3 Marine Mammal Protection Act

The MMPA of 1972 is the principle federal legislation that guides marine mammal species protection and conservation policy in the United States. Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of whales, dolphins, porpoise, as well as seals, sea lions, and fur seals; while the US Fish and Wildlife Service is responsible for walrus, sea otters, and the West Indian manatee.

Off the West Coast, the Steller sea lion (*Eumetopias jubatus*) eastern stock, Guadalupe fur seal (*Arctocephalus townsendi*), and Southern sea otter (*Enhydra lutris*) California stock are listed as threatened under the ESA. The sperm whale (*Physeter macrocephalus*) Washington, Oregon, and California stock, humpback whale (*Megaptera novaeangliae*) Washington, Oregon, and California - Mexico Stock, blue whale (*Balaenoptera musculus*) eastern north Pacific stock, and Fin whale (*Balaenoptera physalus*) Washington, Oregon, and California stock are listed as depleted under the MMPA. Any species listed as endangered or threatened under the ESA is automatically considered depleted under the MMPA.

The West Coast groundfish trawl fishery is considered a Category III fishery, indicating a remote likelihood of or no known serious injuries or mortalities to marine mammals, in the annual list of fisheries published in the *Federal Register*. Based on its Category III status, the incidental take of marine mammals in the West Coast groundfish trawl fishery does not significantly impact marine mammal stocks.

The analysis of impacts to marine mammals will be used to evaluate the consistency of the proposed action with the MMPA

7.1.4 Migratory Bird Treaty Act

The MBTA of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished the populations of many native bird species. The MBTA states that it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The MBTA prohibits the directed take of seabirds, but the incidental take of seabirds does occur.

The analysis of impacts to seabirds will be used to evaluate the consistency of the proposed action with the MBTA.

7.1.5 Paperwork Reduction Act

The Paperwork Reduction Act (PRA) (44 USC. 3501, et seq.) is designed “to minimize the paperwork burden for individuals, small businesses, educational and nonprofit institutions, federal contractors, state, local and tribal governments, and other persons resulting from the collection of information by or for the federal government.” In brief, this law is intended to ensure that the government is not overly burdening the public with requests for information. This is accomplished through an information collection budget (ICB). The ICB for each agency is in terms of the total estimated time burden of responding to official inquiries. The President's Office of Management and Budget (0MB) oversees the ICB of each agency. Agencies must annually identify and obtain clearance from 0MB for new or significant revisions to reporting and record keeping requirements.

Procedurally, the PRA requirements constrain what, how, and how frequently information will be collected from the public affected by a rule that requires reporting (e.g., the amount of fish caught during a fishing trip). New collections of information must be submitted to 0MB for clearance before a final rule may take effect. For each rule that requires a collection of information, the agency must describe in detail what data will be collected, how it will be collected and how often, from whom it will be collected, how much time will be spent by each affected person in complying with the information requirements, why the information is necessary and how it will be used. Information collections approved by 0MB have a maximum effectiveness of three years. To be extended beyond that time requires another submission for 0MB clearance. Required collection of information from the public can not be enforced without being included in an approved ICB.

A trawl IFQ program, if adopted, would contain collection of information requirements subject to the PRA. These would include reporting and recordkeeping requirements for vessels and processors for vessels and processors. These reporting and recordkeeping requirements will be submitted to 0MB for review and clearance.

7.1.6 Regulatory Flexibility Act

This section will contain a summary of the IRFA presented in Appendix A

7.2 Executive Orders

7.2.1 EO 12866 (Regulatory Impact Review)

This section contains a summary of the RIR presented in Appendix A

7.2.2 EO 12898 (Environmental Justice)

Executive Order 12898 (*Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,* 59 Fed Reg 7629 [1994]) requires each federal agency to achieve environmental justice by addressing "disproportionately high and adverse human health and environmental effects . . . on minority populations and low-income populations." This section will address the two main components involved in addressing environmental justice considerations: (1) ensuring effective public participation (among populations that may traditionally have been under-represented in the public participation process) and (2) identifying high and adverse impacts that may disproportionately accrue to low-income populations or minority populations. The latter component will itself consist of two steps: (a) identification of the presence of populations that could trigger environmental justice concerns and (b) an analysis of specific effects on those populations.

7.2.2.1 Public Participation among Minority Populations and Low-Income Populations

EO 12898 requires that communities potentially bearing disproportionately high and adverse effects have meaningful input into the decisions being made about the project. This section will describe what was done to inform the communities about the project and the potential impacts it will have on their communities (e.g., notices, mailings, fact sheets, briefings, presentations, news releases, translations, newsletters, reports, community interviews, telephone hotlines, question and answer sessions, stakeholder meetings, and/or the like), what input was received from the communities, and how that input was utilized in the decisions that were made regarding the project during this stage of the analysis.

7.2.2.2 Identification of Affected Minority Populations and Low-Income Populations

The information contained in this section consists to a substantial degree of an additional screening of fishing community demographic information presented in Appendix B to portray minority populations and low-income populations in relevant communities. This section will also include a description of the methodology and criteria utilized for identifying minority populations and low-income populations and the references used for establishing the criteria. In brief, these will consist of:

- Relevant CEQ and NOAA Fisheries specific guidance regarding "meaningfully greater" minority population or low-income population determination versus a larger comparative context.
- Income indicator screening (utilizing poverty level and income data from US Bureau of the Census) for identified geographies, consistent with those utilized for community analysis in earlier report sections, typically screened against county level data as the reference community, where appropriate, given the geographically dispersed nature of this project. The methodology and justification utilized in determining the reference community will be explicitly presented, with the specific approach depending on the results generated from other impact area analyses (that will then be subjected to environmental justice screening). Where "population pocket" screening is possible utilizing standardized demographic data (e.g., resident processing workers in group quarters) this will be pursued.
- Minority indicator screening (total minority population as defined by total population exclusive of the non-Hispanic white population component) for identified geographies, consistent with those utilized for community analysis in earlier report sections, typically screened against county level data (or other appropriate level as noted for low-income populations). Similar as for low-income population screening, where "population pocket" screening for low-income populations is possible utilizing standardized demographic data this will be pursued as well.

7.2.2.3 Effects of the Proposed Actions on Low-Income and Minority Population

This analysis involves, in part, taking the previously identified impacts associated with the various management alternatives and juxtaposing the footprint of those alternatives with the footprint of populations of concern for environmental justice analysis to provide a comprehensive accounting of all impacts on minority populations and low-income populations. In this case, given the nature of the project, few, if any, physical environment impacts are likely to disproportionately accrue to minority populations or low-income populations. Rather, impacts are much more likely to be economic in nature (but they may include direct, indirect, and cumulative impacts). Reference communities utilized in the impact analysis will be consistent with those used in the screening analysis.

Indicators will include:

- Disproportionate loss of employment among low-income populations or minority populations (compared to employment changes among higher-income or non-minority populations)
- Disproportionate loss of economic activity in low-income population or minority population areas (compared to areas associated with higher-income or non-minority populations)
- Disproportionate loss of revenue to communities associated with low-income populations or minority populations (compared to communities associated with higher-income or non-minority populations)

7.2.3 EO 13132 (Federalism)

EO 13132, otherwise known as the Federalism EO, was signed by the President on August 4, 1999, and published August 10, 1999 (64 FR 43255). The EO superseded the previous Federalism EOs (12612 and 13083), but supplements EOs 12372, 12866, and 12988. This EO is intended to guide federal agencies in the formulation and implementation of "policies that have federalism implications." Such policies are regulations, legislative comments or proposed legislation, and other policy statements or actions that have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. This EO requires federal agencies to have a process to ensure meaningful and timely input by state and local officials in the development of regulatory policies that have federalism implications. A federalism summary impact statement is also required for rules that have federalism implications.

The EO establishes fundamental federalism principles based on the US Constitution, specifies federalism policy making criteria, and special requirements for preemption of state law. For example, a federal action that limits the policy making discretion of a state is to be taken only where there is constitutional and statutory authority for the action and it is appropriate in light of the presence of a problem of national significance. Also, where a federal statute does not have expressed provisions for preemption of state law, such preemption by federal rule making may be done only when the exercise of state authority directly conflicts with the exercise of federal authority. To preclude conflict between state and federal law on fishery management issues, the Magnuson-Stevens Act explicitly establishes conditions for federal preemption of state regulations (and extension of state fishery management authority into the EEZ). Furthermore, close state-federal consultation on groundfish fisheries measures is provided by the Council process.

7.2.4 EO 13175 (Consultation and Coordination with Indian Tribal Government)

The EO on consultation and coordination with Indian tribal governments was signed by the President on November 6, 2000, and published November 9, 2000 (65 FR 67249). This EO supersedes the previous EO 13084: Consultation and coordination with Indian tribal governments. The purpose of this EO is to establish regular and meaningful consultation and collaboration with Indian tribal governments in the development of federal regulatory practices that significantly or uniquely affect their communities; to reduce the imposition on unfunded mandates on Indian tribal governments; and to streamline the application process for and increase the availability of waivers to Indian tribal governments. This EO requires federal agencies to have an effective process to involve and consult with representatives of Indian tribal governments in developing regulatory policies and prohibits regulations that impose substantial direct compliance costs on Indian tribal communities.

7.2.5 EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds)

EO 13186 supplements the MBTA (above) by requiring federal agencies to work with the USFWS to develop memoranda of agreement to conserve migratory birds. NMFS is in the process of implementing a memorandum of understanding. The protocols developed by this consultation will guide agency regulatory actions and policy decisions in order to address this conservation goal. The EO also directs agencies to evaluate the effects of their actions on migratory birds in environmental documents prepared pursuant to NEPA.

The analysis of impacts to seabirds will be used to evaluate the consistency of the proposed action with EO 13186.

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9 Acronyms and Glossary

Item	Definition
ABC	Allowable Biological Catch
BO-TCV	Bought-out trawl catcher vessels
BPnoTG	Buyers and processors with no purchases of trawl groundfish
BPwTG	Buyers and processors with purchases of trawl groundfish
CW-TCV	Combination whiting trawl catcher vessels
EIS	Environmental Impact Statement
IEP	Independent Experts Panel
IFQ	Individual Fishing Quota
IQ	Individual Quota
IW-TCV	Inshore whiting trawl catcher vessels
LD-TCV	Large diversified trawl catcher vessels
MSY	Maximum Sustainable Yield
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
OW-TCV	Offshore whiting trawl catcher vessels
OY	Optimum Yield
PacFIN	Pacific Fisheries Information Network
PFMC	Pacific Fishery Management Council
QP	Quota Pound
QS	Quota Share
RecFIN	Recreational Fisheries Information Network
SAFE	Stock Assessment and Fishery Evaluation
SD-TCV	Small diversified trawl catcher vessels
TIQ	Trawl Individual Quota
TIQC	Trawl Individual Quota Committee

Item	Definition

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11 Index

12 Appendix A: Regulatory Impact Review/Initial Regulatory Flexibility Analysis

12.1 Regulatory Impact Review

12.1.1 Introduction

EO 12866, Regulatory Planning and Review, was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. The EO covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. Section 1 of the EO deals with the regulatory philosophy and principles that are to guide agency development of regulations. It stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits across all regulatory alternatives. Based on this analysis, NMFS should choose those approaches that maximize net benefits to society, unless a statute requires another regulatory approach.

The regulatory principles in EO 12866 emphasize careful identification of the problem to be addressed. The agency is to identify and assess alternatives to direct regulation, including economic incentives such as user fees or marketable permits, to encourage the desired behavior. Each agency is to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only after reasoned determination the benefits of the intended regulation justify the costs. In reaching its decision agency must use the best reasonably obtainable information, including scientific, technical and economic data, about the need for and consequences of the intended regulation.

NMFS requires the preparation of an RIR for all regulatory actions of public interest; implementation of rebuilding plans includes the publication of strategic rebuilding parameters in federal regulations. The RIR provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure the regulatory agency systematically and comprehensively considers all available alternatives, so the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of EO 12866.

The RIR analysis and an environmental analyses required by NEPA have many common elements and they have been combined in this document. The following table shows where selected elements of an RIR, as required by EO 12866, are located.

Required RIR Element	Corresponding Section
Description of management objectives	Section 1.1.2 Purpose of the Proposed Actions
Description of the fishery	Chapter 3 Resource and Stakeholder Profiles

Statement of the problem	Section 1.1.1 Need for Action (Problems for Resolution)
Description of each alternative considered in the analysis	Chapter 2 Description of Proposed Alternatives

The RIR is designed to determine whether the proposed actions could be considered "significant regulatory actions" according to EO 12866. The EO 12866 test requirements used to assess whether or not an action would be a "significant regulatory action" and the expected outcomes of the proposed management alternative are discussed below. A regulatory program is "economically significant" if it is likely to result in the following effects:

l.a. Have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities.

1.b. Present a risk to long term productivity:

2. Create a serious inconsistency or otherwise interfere with action taken or planned by another agency.

3. Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof.

4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this EO.

12.1.2 Economic analysis of the Alternatives

This section will provide a quantitative assessment of net benefits and distributional effects, augmented by a qualitative assessment where appropriate.

The information necessary to fully evaluate net national benefits associated with socioeconomic impacts cannot be reasonably obtained at this time. Currently available information includes historic data on commercial vessel landings and ex-vessel revenue gleaned from fish-tickets and projections of limited entry trawl vessel participation (landings and revenue) under the alternatives provided by the NMFS Bycatch Model. Additional information that is necessary to perform a net benefits analysis includes production cost information for vessels and production cost, product volume and price information for processors.

Efforts are underway to collect representative production cost information from participating commercial fishing vessels. The NMFS Northwest Fisheries Science Center is undertaking a cost-earnings survey of the limited entry trawl fleet during the first quarter of 2005. With a satisfactory response rate, this survey will provide improved data for estimating potential efficiency gains from implementation of a trawl IFQ program.

As described in Section 4.1.7 the Consulting Team proposes to use the information bases available at the time of the impact analysis to develop a set of models designed to focus on the following specific issues:

- The distributional effects of the initial allocation of QS in a trawl IFQ program.
- The potential consolidation of the trawl groundfish harvesting sector following the allocation
- The potential to reduce catches of incidental species.

- The likelihood that additional profits could offset additional observer costs
- The potential to increase profits

The output from these models will enable analysts to 1) determine how permit holders would fare under initial IFQ allocation options relative to baseline (2005) participation levels; 2) predict which permit holders are most likely to leave the fishery under a given level of consolidation. This information will be then be used in other models and in the community impact analysis; 3) predict the ability of harvesters to reduce bycatch rates; 4) assess whether the potential for increase in profits for vessels in different vessel classes could fully offset increased costs of observers and monitoring; and 5) estimate the marginal revenue attainable from purchased IFQs based on a range of assumed change in variable costs scenarios.

In the absence of adequate data on prices, costs and profitability of buyers and processors, ex-vessel revenue will be used as a proxy indicator of profits. From the buyers' perspective, ex-vessel revenue represents expenditures for a primary production input. Projected change in ex-vessel revenue under the alternatives will be stratified by different categories to examine impacts by buyer/processors' relative size and level of involvement in or dependence on trawl groundfish purchases.

12.1.2.1 Changes in Net Benefits within a Benefit-Cost Framework

This section will provide a quantitative assessment of net benefits, augmented by a qualitative assessment where appropriate.

For businesses, the change in profit can be used as a measure of the change in net benefits. The change in net benefits to consumers can be measured in terms of the change in consumer surplus. In addition changes in non-market value and ecosystem service will be qualitatively assessed.

12.1.2.2 Changes in the Distributional Effects

Changes in the distribution of benefits and costs reflect changes in the benefits and costs of groups of individuals, businesses of differing sizes, and other entities (including small communities and governmental entities).

12.1.2.3 Changes in Income and Employment

Regional economic models, including input-output models, will be used to estimate the regional income and employment effects of alternative regulatory actions..

12.2 Initial Regulatory Flexibility Analysis

12.2.1 Introduction

When an agency proposes regulations, the Regulatory Flexibility Act (RFA) (5 USC. § 601-612) requires the agency to prepare and make available for public comment an initial regulatory flexibility analysis (IRFA) that describes the impact of the proposed rule on small businesses, nonprofit enterprises, local governments, and other small entities. The IRFA is to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities..

The level of detail and sophistication of the analysis should reflect the significance of the impact on small entities. Under 5 USC., Section 603(b) of the RFA, each IRFA is required to address:

1. A description of the reasons why action by the agency is being considered;

2. A succinct statement of the objectives of, and the legal basis for, the proposed rule;

3. A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;

4. A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;

5. An identification, to the extent practicable, of all relevant federal rules that may duplicate, overlap or conflict with the proposed rule;

6. A description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and that minimize any significant economic impact of the proposed rule on small entities.

12.2.2 Reasons for Considering the Proposed Rule

The reasons for considering the proposed action are discussed in Section 1.1.1 Need for Action (Problems for Resolution).

12.2.3 Objectives and Legal Basis of the Proposed Rule

The objectives of the proposed action are discussed in Section 1.1.2 Purpose of the Proposed Actions. Section 1.1.3.3 Groundfish Management Context provides information on the legal basis for the proposed rule.

12.2.4 Description and Number of Small Entities to which the Proposed Rule will Apply

12.2.4.1 Definition of a Small Entity

Three types of small entities are defined in the RFA:

Small business - Section 601(3) of the RFA defines a small business as having the same meaning as small business concern under section 3 of the Small Business Act. This includes any firm that is independently owned and operated and is not dominant in its field of operation. The US Small Business Administration (SBA) has established size criteria for all major industry sectors in the US, including fish harvesting and fish processing businesses. A business involved in the commercial catching or taking of finfish is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates), and if it has combined annual receipts not in excess of $4.0 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation (including its affiliates) and employs 500 or fewer persons, on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $4.0 million criterion for fish harvesting operations.

Finally, a wholesale business servicing the fishing industry is a small business if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U. S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 USC. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when (1) A person is an affiliate of a concern if the person owns or controls, or has the power to control 50 percent or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock, or (2) If two or more persons each owns, controls or has the power to control less than 50 percent of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors or general partners control the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint venturers if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

Small organizations - The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

Small governmental jurisdictions - The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of less than 50,000.

12.2.4.2 Description of Small Entities to Which the Rule will Apply

Federal courts and Congress have indicated that a RFA analysis should be limited to small entities subject to the regulation. As such, small entities to which the rule will not apply are not considered in this analysis.

The proposed alternatives would apply to businesses involved in the harvesting or processing of West Coast groundfish. There do not appear to be any entities that are directly regulated by the proposed action that would qualify as either "small nonprofit" entities, nor "small government jurisdictions."

12.2.4.3 Estimate of the Number of Small Entities to Which the Rule will Apply

[The data presented in this section are preliminary - estimates of the number of small entities will be updated during Stage 2]

The data available for this analysis are based on vessel and buyer/processor identifiers included in the PacF1N data system. The vessel and processor counts are based on unique vessel and buyer/processor identifiers. However, it is known that in many cases a single firm may own more than one vessel, or a buyer/processing facility may include more than one profit center. Therefore, the counts should be considered upper bound estimates. Additionally, businesses owning vessels and/or buyers and processors may have revenue from fisheries in other geographic areas, such as Alaska, or from non-fishing activities. Therefore, it is likely that when all operations of a firm are aggregated, some of the small entities identified here are actually larger than indicated.

Seafood Harvesters - Most of the vessels, processors, and related businesses engaged in the West Coast groundfish trawl fishery would be classified as small businesses under the SBA definition. A total 4,588 commercial vessels fishing from West Coast ports, 1,709 vessels had some involvement in West coast groundfish fisheries. Of these, 421 held groundfish limited entry permits, and an additional 771 participated in open access groundfish fisheries and derived more than 5% of total revenue from groundfish. Ninety-one limited entry trawl vessels, representing 35% of the limited entry trawl fleet, were permanently retired under a recent buyback program. The share of annual groundfish ex-vessel revenue retired under the buyback was somewhat greater, 36% including whiting or 46% of non-whiting ex-vessel revenue. There has been some concern that effective capacity in the fishery will not actually be reduced this much due to reactivation of “latent” permits. There were 24 permits not fished at all during 2001 through 2003, and 40 permits not fished at all in 2002 and 2003. Events have shown that of the 20 limited entry trawl permits that have changed hands since the buyback was completed, 14 of these permits had no recorded landings in 2002. Six buyback participants have reentered the limited entry trawl fishery, purchasing a total of 11 permits.

Buyers/Processors - A total 1,780 fish buyers on the West Coast, 732 bought at least some groundfish from commercial fishermen. All but 19 of these purchased less than $2 million worth of total harvest during the year 2000. A few buyers/processors may not qualify as small businesses under the SBA criterion. Fewer than nine buyers/processors that process groundfish were listed as employing more than 500 people (Warren 2004). However the employee counts for these buyers/processors include operations in Alaska and processing for species other than groundfish. Many of the listed employees are therefore likely in Alaska due to the much higher volumes of fish processing done there. Finally, since most processing employment is seasonal, many of these buyers/processors would not be expected to employ more than 500 employees year round.

12.2.5 Description of the Projected Reporting, Record Keeping and Other Compliance Requirements of the Proposed Rule

12.2.5.1 Description of Compliance Requirements of the Proposed Rule

12.2.5.2 Description of Compliance Costs Associated with the Proposed Rule

12.2.5.3 Estimate of the Regulatory Burden and Distributional Effects

12.2.5.4 Description of Potential Benefits of the Proposed Rule to Small Entities

12.2.6 Identification of Relevant Federal Rules that may Duplicate, Overlap or Conflict with the Proposed Rule

NOAA Fisheries is unaware of any duplicative, overlapping, or conflicting federal rules.

12.2.7 Description of Significant Alternatives to the Proposed Rule

An IRFA must consider all significant alternatives that accomplish the stated objectives of the applicable statues and minimize any significant economic impact of the proposed rule on small entities. "Significant alternatives" are those with potentially lesser impacts on small entities (versus large-scale entities) as a whole. The kinds of alternatives that are possible will vary based on the particular regulatory objective and the characteristics of the regulated industry. However, section 603(c) of the RFA gives agencies some alternatives that they must consider at a minimum:

1. Establishment of different compliance or reporting requirements for small entities or timetables that take into account the resources available to small entities.

2. Clarification, consolidation, or simplification of compliance and reporting requirements for small entities.

3. Use of performance rather than design standards.

4. Exemption for certain or all small entities from coverage of the rule, in whole or in part.

13 Appendix B: Social Impact Assessment Technical Appendix

This technical appendix will consist of a set of detailed community and regional profiles that will build on existing descriptive work as informed by the analysis of fishery-related activity specific to the trawl fishery that will potentially be impacted by the proposed management alternatives. Existing work does not provide the detail at the community level of analysis that we would seek, specifically for the links of particular fishery sectors to individual communities and the relationships of those sectors to larger community engagement and dependency attributes.

13.1 Introduction

For the purposes of social impact assessment, a two-pronged approach to analyzing the community or regional components of potential change associated with the proposed trawl management alternatives will be utilized. First, summary tables based on existing quantitative fishery information (and accompanying narrative discussions) will be developed to illustrate patterns of participation in the various components of the fishery. These will be presented in the main body of the RIR and summarized in the relevant EIS sections, as discussed in Section 3.10 and Section 4.10. This analysis will focus on the fishery sectors (e.g., catcher vessels) and portray the baseline distribution of these sectors across communities and regions (Section 3.10), along with associated activities (e.g., landings). The associated analysis of alternatives section in the EIS (Section 4.10) will look at the potential differential distribution of impacts to communities and regions that would accompany potential changes in the sectors brought about by the various management alternatives.

The second approach to producing a comprehensive SIA involves selecting a set of trawl fishery communities for characterization to describe the range, direction, and likely order of magnitude of social and community level impacts associated with the management alternatives for the trawl fishery. In short, this approach uses the community or region as the primary frame of reference or unit of analysis to assess the nature of engagement or dependency on the fishery in terms of the various sectors present in the community and the relationship of those sectors to the rest of the local social and economic context. This approach will be contained in this technical appendix.

Our starting point for defining affected communities will be the 2005-2006 groundfish fishery specification EIS (PFMC, 2004) and data from Davis (2005) which may be used to provide a list of regions, homeports and landing ports (see Table 13-1).

Table 13-1. Regions, Homeports and Landings Ports with Trawl Activity

State	Region	Trawl Vessel Homeport	Trawl Landings Port
WA	Northern Puget Sound	Bellingham	
WA	Northern Puget Sound	Blaine	Blaine
WA	Coastal Washington North	Neah Bay	Neah Bay
WA	Coastal Washington South and Central	Westport	Westport
WA	Coastal Washington South and Central	Ilwaco/Chinook	Ilwaco
OR	Astoria	Astoria	Astoria
OR	Tillamook	Tillamook/Garibaldi	Garibaldi
OR	Newport	Newport	Newport
OR	Coos Bay	Coos Bay	
OR	Coos Bay	Florence	Florence
OR	Coos Bay		Charleston
OR	Brookings	Brookings	Brookings
CA	Crescent City	Crescent City	Crescent City
CA	Eureka	Eureka	Eureka
CA	Fort Bragg	Fort Bragg	Fort Bragg
CA	Fort Bragg	Other Mendocino County	
CA	Bodega Bay	Bodega Bay	Bodega Bay
CA	San Francisco	San Francisco	San Francisco
CA	San Francisco	Princeton/Half Moon Bay	Princeton
CA	San Francisco	Other SF Area	
CA	Monterey	Monterey	Monterey
CA	Monterey	Santa Cruz	Santa Cruz
CA	Monterey	Moss Landing	Moss Landing
CA	Morro Bay	Morro Bay	Morro Bay
CA	Morro Bay	Avila	Avila
CA	Los Angeles	Los Angeles	
CA	Los Angeles	Long Beach	
CA	San Diego	San Diego	
CA	San Diego	Oceanside	

The choice of specific communities and regions to be profiled in this appendix will be driven by relevant data availability (e.g., information on where are relevant trawl vessels located) and by data confidentiality considerations. Looking at trawl vessel distribution as an example, within the state of Washington only two communities (Port Angeles and Westport, with 4 and 7 vessels, respectively) have three or more vessels each, allowing community level data discussions. Only two other Washington communities are listed as having any relevant catcher vessels (Blaine with 2 vessels and Ilwaco/Chinook with 1 vessel). Neither of these communities can be discussed individually due to confidentiality considerations, so these vessels will either be lumped into larger regional groupings (such as Blaine with Port Angeles into a Northern Puget Sound area and Ilwaco/Chinook with Westport into a Coastal Washington South and Central area), following the groupings utilized in previous groundfish EIS analyses. The advantage of staying with community-specific data is the ability to ultimately better describe impacts (and variations of impacts) at the community level, while the advantage of utilizing regions is to allow for an analysis that accommodates all available information (but at the expense of community level detail).

Oregon trawl vessel communities that could be described on an individual community basis include Astoria (32 vessels), Newport (20 vessels), Coos Bay (16 vessels), and Brookings (6 vessels). Florence, with 1 vessel, could be lumped with Coos Bay and similarly Tillamook, with 2 vessels, could be lumped with Astoria for a more regional coverage and for the sake of completeness.

Within California, a total of nine communities feature three or more trawl vessels that would, in turn, allow for community level discussions. These are Crescent City (3 vessels), Eureka (9 vessels), Fort Bragg (9 vessels), Princeton/Half Moon Bay (9 vessels), San Francisco (5 vessels), Monterey (4 vessels), Moss Landing (5 vessels), Avila (3 vessels), and Morro Bay (3 vessels). Only two California communities have less than three vessels, precluding a community level data discussion: Bodega Bay (1 vessel) and Santa Cruz (2 vessels). These communities could be lumped with others for regional groupings and, if appropriate and desired, some of the other communities could be further be lumped to simplify the analysis (e.g., Avila and Morro Bay have been lumped into a single region in earlier analyses).

If permit data rather than vessel data were chosen, a different set of communities fall out, particularly after common ownership is taken into account to further narrow information that can be released without confidentiality restrictions. If four or more entities are taken as the minimum threshold for release, the following communities could be discussed on an individual basis:

- Oregon: Astoria, Charleston, Clackamas, Coos Bay, Garibaldi, Newport and Warrenton.
- California: Eureka, Fort Bragg, Half Moon Bay, and San Francisco.
- Washington: Seattle.

If port landings data are chosen, yet a different set of communities emerge that could be discussed on an individual basis. Ultimately, as noted in Section 3.10, we would be seeking analytic power and utility within individual communities or groups of communities with common attributes to allow for a production of the best available information regarding potential community and social impacts for consideration by decision makers. The decision regarding appropriate aggregations of communities will also be informed by community or regional level information on processing and support service entities as well as data on vessels themselves.

Linking processing related data to communities is likely to prove difficult for at least two reasons. First, geographically linked processing data are scarce. Second, confidentiality concerns are even more pronounced with processing entities than they are with harvest entities, given the smaller overall number and the specific distribution of participants. It is likely that the processing related aspects of the community based discussions will, as a result of these difficulties, be more qualitative than quantitative in nature. Further complicating this analysis is the fact that it is not uncommon for landed catch to be trucked from the point of landing to processing facilities elsewhere, meaning that the attribution of economic activity to particular locations is inherently challenging. Again, however, we will attempt to qualitatively describe patterns of activity where quantitative information is scarce.

The final selection of communities for profiling will follow an analysis of the data and it is anticipated that different types of information will be developed for different geographic footprints, shaped by confidentiality concerns. The outline of the remainder of the technical appendix is as follows:

13.2 Overview of Trawl Community Socioeconomic Profiles

13.3 Background and Methodology

13.4 Community Variability

13.4.1 Location and Historical Ties to the Fishery

A general literature review will be conducted, but several recent efforts have provided more or less standardized information across a wide range of west coast fishing communities that will be of direct use for the current effort. These include:

- West Coast Marine Fishing Community Descriptions. Jennifer Langdon-Pollock, Pacific States Marine Fisheries Commission, Economic Fisheries Information Network, January 2004.
- Fishing Communities (Appendix A, Section 8.0), Proposed Acceptable Biological Catch and Optimum Yield Specifications and Management Measures: 2005-2006 Pacific Coast Groundfish Fishery EIS. Pacific Fishery Management Council, October 2004.
- Draft Supplemental Community Profiling Document: Community Profiles for West Coast and North Pacific Fisheries – Washington, Oregon, California, and other US States. Norman, Sepez, Lazrus, Milne, Package, Russell, Grant, Petersen, Primo, Styles, Tilt, and Vaccaro, Socioeconomics Program NWFSC and Economics and Social Sciences Research Program AFSC, 2006.

Other recent reports have focused on aspects of the fishery in particular locations. These include:

- Socio-economics of the Moss Landing Commercial Fishing Industry: Report to the Monterey County Office of Economic Development. Pomeroy and Dalton, June 2003.
- Market Channels and Value Added to Fish Landed at Monterey Bay Area Ports. Pomeroy and Dalton, California Sea Grant College Program, 2005.

13.4.2 Community Socioeconomic Structures

This section will lay out a typology of communities based (a) the structure of the communities themselves and (b) on nature and degree of engagement in, and dependence upon, the West Coast groundfish trawl fishery.

13.5 Social Impact Experience with IQ or Other Rationalization Programs

13.5.1 Summary Review of Relevant Literature

In addition to a general literature review on community impacts related to IQ and other fishery rationalization related experience, an additional focus will be put on incorporating recent work has been completed by management entity staff directly related to the currently proposed management alternatives. These include:

- Communities and Individual Quota Programs: Discussion on Community Definitions, Community Eligibility Criteria and Allocation Process in Quota Systems, Suzanne Russell, NWFSC, n.d. (circa 2005)
- Individual Fishing Quotas in Multi-species Fisheries: Objectives, Outcomes, Design Elements and Preliminary Thought on the Challenges for the Pacific Groundfish Fishery, Kate Quigley, NOAA Fisheries NW Region, August 26, 2004.
- Practicability Analysis for Amendment 18: Bycatch Mitigation and Standardized Total Catch Reporting Methodologies (Preliminary Discussion Draft). NMFS Northwest Region, October 2005.
- Update on Trawl Individual Quota Process and Community Concerns (includes Appendix: Community Involvement Programs and Community Impact Control Mechanisms Used in ITQ Systems). PFMC Agenda Item H.11, Situation Summary, November 2005.
- Catch-Quota Balancing in Multi-species Individual Fishing Quotas. Sanchirico, Holland, Quigley and Fina, Resources for the Future, November 2005. (This document is not as directly tied to the current fishery management initiative as the previous three, but is still relevant nonetheless.)

These have also been recent documents generated by a number of groups involved as stakeholders in the ongoing fishery management process that are directed toward aspects of community impact assessment. These documents will also be reviewed for perspectives and data to include in the overall background literature review. These documents include:

- Addressing Community Concerns in the Development of Individual Fishing Quota Program Alternatives for the Pacific Groundfish Trawl Sector: A Survey of Community Stakeholders. Environmental Defense, September 6, 2004
- Coastal Fishing Community Considerations in the Context of Trawl IFQs. Ginny Goblirsch, Community Representative, PFMC Trawl IQ Committee, October 18, 2004.
- The Economic Impacts of Food Plant Closure: Analysis of the Pacific Coast Seafood Plant in Warrenton, Oregon. Globalwise, Inc., for Pacific Seafood Group, February 23, 2004.

13.5.2 Region Specific Experience

This section will include a summary of region-specific experience in other IQ or rationalization programs and the outcomes of those programs that may be brought forward as "lessons learned" to be applied to the current alternatives analysis. This information will, for example, include experience in the offshore whiting co-ops. Further, other recent relevant region-specific management outcome information that may inform prediction of future trawl IQ impacts will be summarized in this section. This will include, for example, the results of the recent buy-back program and the associated changes in patterns of engagement and dependency across communities.

13.5.3 Structure of Proposed Community Options

This section will provide an overview of the proposed options designed to address community impact concerns. These include three main options:

- Community Stability Holdback Option
- Community Involvement Option

- Existing Community Impact Control Mechanism Options

These options have a number of suboptions as well and are listed in outline form below. These sections would provide a general level componential analysis of likely social impact outcomes based on the structure of the options and suboptions themselves.

13.5.3.1 Community Stability Holdback Option

- General
  - Portion of annual QP held back and allocated for proposals submitted by IFQ holders
  - Proposals evaluated with priority on community benefits
  - Shares held back continue to be trawl shares
- Holdback
  - Up to 20 percent [previously 25 percent] of total annual QP for [non-whiting] shoreside component of trawl fishery (but period may be greater than one year)
  - Suboptions of (A) 20 percent, (B) 10 percent, (C) 5 percent, and (D) 5 percent in year one, increasing by 5 percent each year until the total set aside is 20 percent.
- Committee
  - Appointed by the Council, recommendations approved by Council before forwarding to NMFS
  - Role to make recommendations with the purpose of achieving community development, enhancement, or stabilization goals
  - Composed of representatives of West Coast regions, port districts, processors, and fishermen
  - Staffing by NMFS + Council (option A) or Council (option B)
- Eligibility for Participation
  - IFQ holders [previously joint fishermen/processor proposals]; may work together in collaboratives
  - IFQ holders may only participate in one proposal
- Allocation Criteria
  - To be developed, but quantitative in nature for consistent application to proposals
  - Potential criteria may or may not include:
    - Past performance (performance on past commitments)
    - Utilization (indicator of wastage and pollution externalities)
    - Local added value (value of exports divided by landings)
    - Local labor employment (percentage of local employees)
    - Local labor earnings (wages to product value ratio)
    - Public debt related to fisheries investment (fishery infrastructure debt relying on fisheries activity repayment)

- Public investment dedicated to fisheries (total public investments supporting fishing industry)
- Port dependence (proportion of total port revenue derived from fisheries activity)
- Other (to be identified through public comment)

13.5.3.2 Community Involvement Option

- Committee
  - Convened by Council; composed of representatives of West Coast regions, port districts, processors, and fishermen
  - Make recommendations pertaining to IFQ program and its impact to port districts, regions, processors, and fishermen

13.5.3.3 Existing Community Impact Control Mechanism Options

- Allowing communities to hold quota
- Setting limits on quota accumulation
- Allocations of whiting and non-whiting groundfish species for shoreside and at-sea delivery
- Temporarily prohibiting QS transfer after initial allocation (to be analyzed but NOT a part of current alternatives)
- Distribute revoked shares or reclaimed quota to new entrants

13.6 Community Profiles

13.6.1 Community #1

13.6.1.1 Community Demographics

- Total Population, Ethnicity, Age and Sex, Housing
- Occupation, Employment, Income

13.6.1.2 Local Economy and Links to the Trawl Fishery

- Harvesting (fleet characteristics, permits, landings, employment, etc.)
- Processing (buyer/processor characteristics, volumes, patterns of movement between landing and processing, employment, etc.)
- Fishery Support Services (vessel and processor support related activity characterization)
- Other Local Business Activity/Local Economic Base Summary (for baseline of economic dependency analysis)

13.6.1.3 Community Revenues (estimated revenues in community revenue context)

13.6.1.4 Summary of Recent Community Rationalization Experience (including lessons learned)

13.6.1.5 Differential Impacts of Trawl Fishery Management Alternatives (general level discussion)

13.6.2 Community #2 (etc.)

14 Appendix C: Components Analysis

The major goal of the Components Analysis and Components Tables (See Table 2-3 and Table 2-4) is to ensure that the details of each alternative are adequately considered by clearly specifying how the different elements fit together within an alternative; and to identify unknown or unintended potential effects on resources and stakeholders groups. The Components Table and Components Analysis also identify and analyze options that were discussed but not brought forward into the main suite of alternatives.

14.1 Analysis of Components, Elements, and Options

The analysis of the components, elements and options that comprise the Trawl IFQ Program is of critical importance. A thorough analysis of each of the components, elements, options and sub-options can provide the Council with the necessary information to refine their Alternatives, or even to eliminate Alternatives.

The remainder of this section lists the section provides and indication of the section headings proposed for the Components Analysis. In general the components analysis would have a section for each of the components defined in the Components Tables. Within each component section the various elements and options are described, discussed, and analyzed.

14.1.1 Analysis of Elements and Options Contained in Component 1

Component 1

Element 1.1

Option 1.1.1

Sub-Option 1.1.1.1

14.1.2 Analysis of Elements and Options Contained in Component 2

Component 2

Element 2.1

Option 2.1.1

Sub-Option 2.1.1.1

14.2 Preliminary Analysis of Distributions of Catch History and Potential QS by Species

This section contains a further examination of the question of whether allocations QS for incidental species should utilize historical catches. The Consulting Team has included this preliminary analysis for two reasons: 1) it provides insight in the question of how to allocate QS for incidental species, and 2) it provides an example of the type of analysis that would be included in the components analysis.

In this analysis of preliminary analysis of catch history, the Consulting Team examined PacFIN Fish-Ticket from 1994-2003. We combined catch information with permit holder data from the NMFS NW Region. With the permit data analysts were able to examine fish-ticket catches of two major groups of limited entry trawl permits—permit that were bought back during the 2003 buyback and permits that remained at registered permits after the buyback. This distinction is important because all of the options in the alternatives re-distribute the aggregate catch of "bought-back permits" on an equal shares basis to each of the remaining permits that are assigned to catcher vessels.[36]

Table 14-1 shows the shore-based landings from PacFIN Fish tickets of selected species by from 1994-2003. Two groups of permits are shown landings assigned to permits to bought-out permits, and landings assigned to post-buyback permit holders. If the amount landed by the bought-out permit is relatively high, then redistributing that catch in the allocation of QS can add significant amounts of QS to remaining permit holders. This may be particularly important if QS of incidental catch is allocated based on historical landings. If on the other hand, the amount landed by the bought-out permit is relatively low (see cabezon and butter sole as examples), then the re-distribution will have a much smaller impact.

[36] Permits assigned to Catcher Processors would not share in this redistribution.

Table 14-1. Shore-based Landings of Limited Entry Trawl Permit Holder Groups by Species, 1994-2003

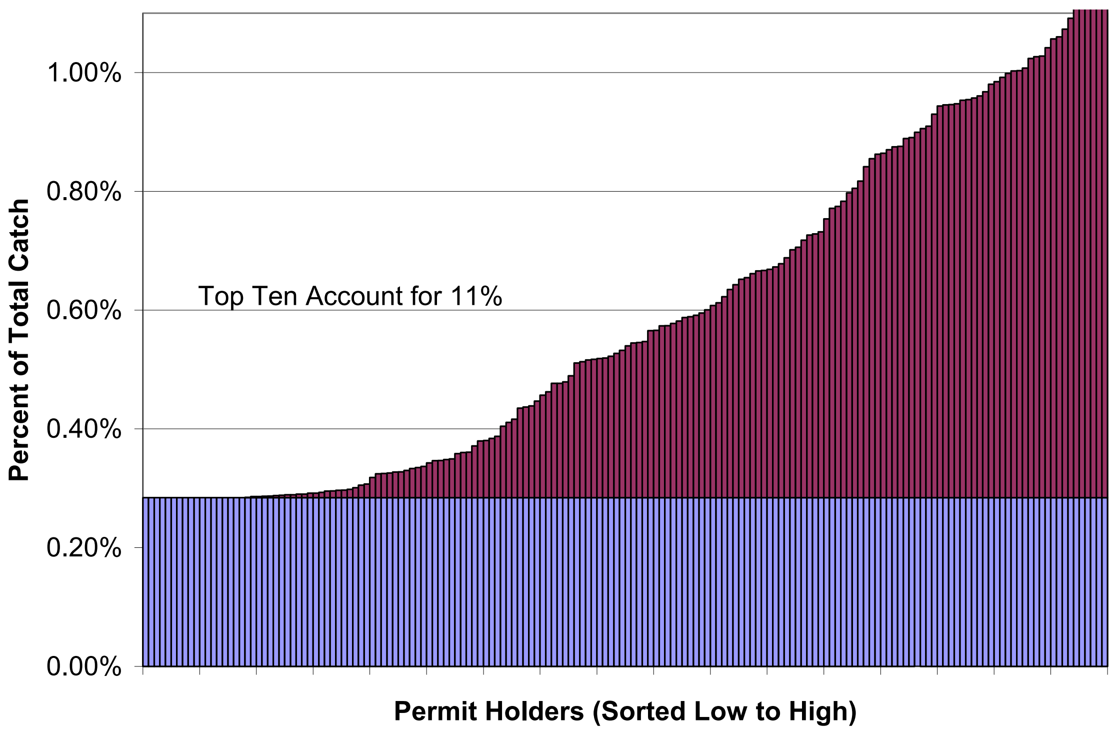
	Bought-out Permits		Post-Buyback Permit Holders		Catch of All Permit Holders
Species	**Lbs (1,000s)**	**Percent**	**Lbs (1,000s)**	**Percent**	**Lbs (1,000s)**
Black Rockfish	37	13.49	238	86.51	275
Butter Sole	5	16.38	24	83.62	28
Cabezon	1	4.69	11	95.31	12
California Scorpionfish	4	24.95	13	75.05	17
Canary Rockfish	4,233	50.52	4,145	49.48	8,378
Curlfin Sole	17	25.76	48	74.24	64
Darkblotched Rockfish	289	48.90	302	51.10	591
Dover Sole	92,664	48.29	99,241	51.71	191,905
English Sole	9,498	41.03	13,652	58.97	23,149
Flathead Sole	38	42.46	52	57.54	90
Lingcod	5,867	48.60	6,205	51.40	12,072
Nearshore Rockfish	24	22.99	81	77.01	106
Pacific Cod	6,472	54.84	5,329	45.16	11,801
Pacific Whiting	138,802	8.44	1,505,495	91.56	1,644,296
Petrale Sole	18,352	49.46	18,750	50.54	37,102
Rex Sole	6,443	42.42	8,746	57.58	15,189
Sablefish	31,128	48.11	33,573	51.89	64,701
Sanddabs	6,350	30.46	14,497	69.54	20,847
Shortbelly Rockfish	74	34.93	138	65.07	211
Spiny Dogfish	6,575	71.30	2,647	28.70	9,222
Thornyheads	43,117	48.56	45,678	51.44	88,795
Walleye Pollock	3,054	33.65	6,020	66.35	9,074
Widow Rockfish	30,974	37.05	52,631	62.95	83,605
Yelloweye Rockfish	22	64.51	12	35.49	34

Figure 14-1 provides a preliminary assessment of an allocation of QS based on 1994-2003 landings for Dover sole. The figure is provided as an illustration and should not be considered official. All post-buyback permit holders were included.[37] In the figure, permits are sorted by landings history from low to high—each small bar represents the catch of a one permit of the 170 remaining after the buyback. The lighter shaded bars represent the equal-share redistribution of landings of bought-out permits. The darker-shaded bars represents landing of remaining permits. A tick-mark horizontal axis is shown for every ten permits. As is readily seen in the figure, the distribution of landings by remaining permit holders is highly skewed—highliners land significantly higher amounts of Dover sole than most permit holders. It should be noted however, that while this distribution appears to be highly skewed, the distribution of Dover sole landing are among the least skewed of all groundfish species. The note inside the figure indicate the percentage of total Including re-distributed catches) of the top ten permits—in the case of Dover sole the top-ten permits accounted for 11 percent of the total landings. A critical finding of this figure is that for many permit holders, the re-distribution of landings from bought-out permits would constitute the majority of their QS.

[37] Actual options may require more recent participation to qualify for QS.

The next five pages show similar figures for other species, including a mix of primary target species, non-constraining incidental catch species, and overfished species. A careful examination of the figures provides insight into the distribution of landings overtime. It should be noted that all of the figures are truncated at the top to protect the confidentiality of the permits with the highest landings.

Figure 14-1. Dover Sole Catch Distribution—Post Buyback Permit Holders 1994-2003



Note: The set of bars at the bottom of the figures, represent the catch of bought out boats evenly distributed to remaining permit holders. The darker shaded bars represent the actual catch of remaining permit holders.
Source: PacFIN data originally provided to Shannon Davis in August 2004.

Figure 14-2. Thornyhead Catch Distribution—Post Buyback Permit Holders 1994-2003

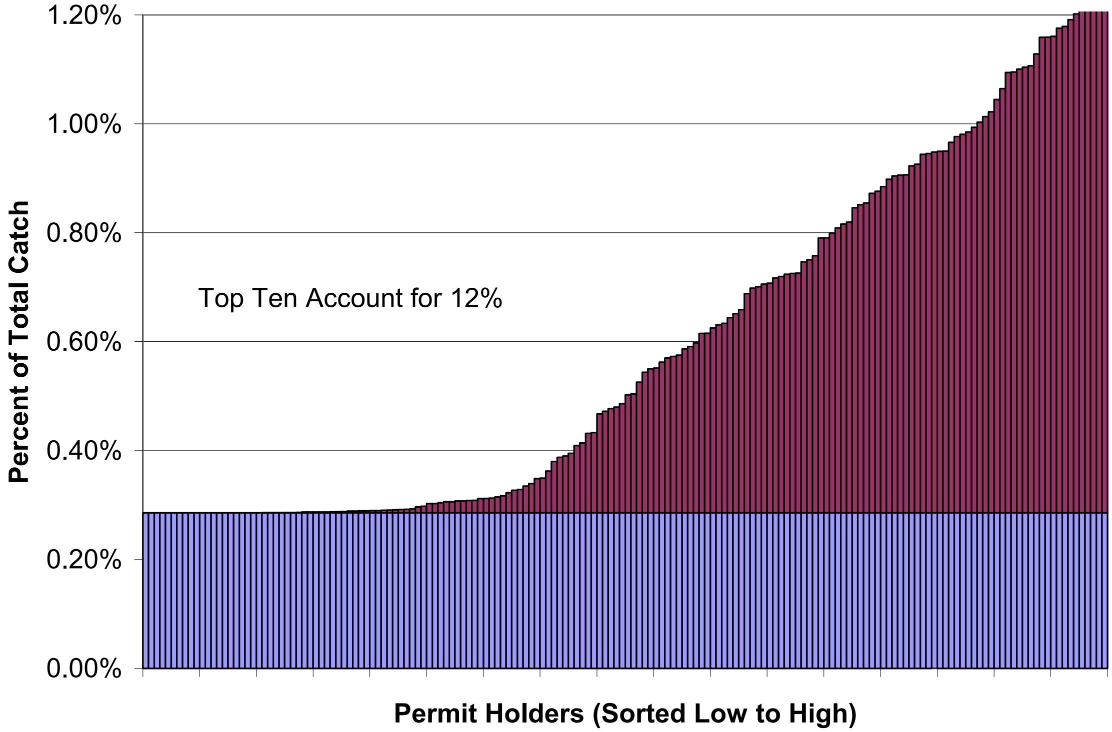
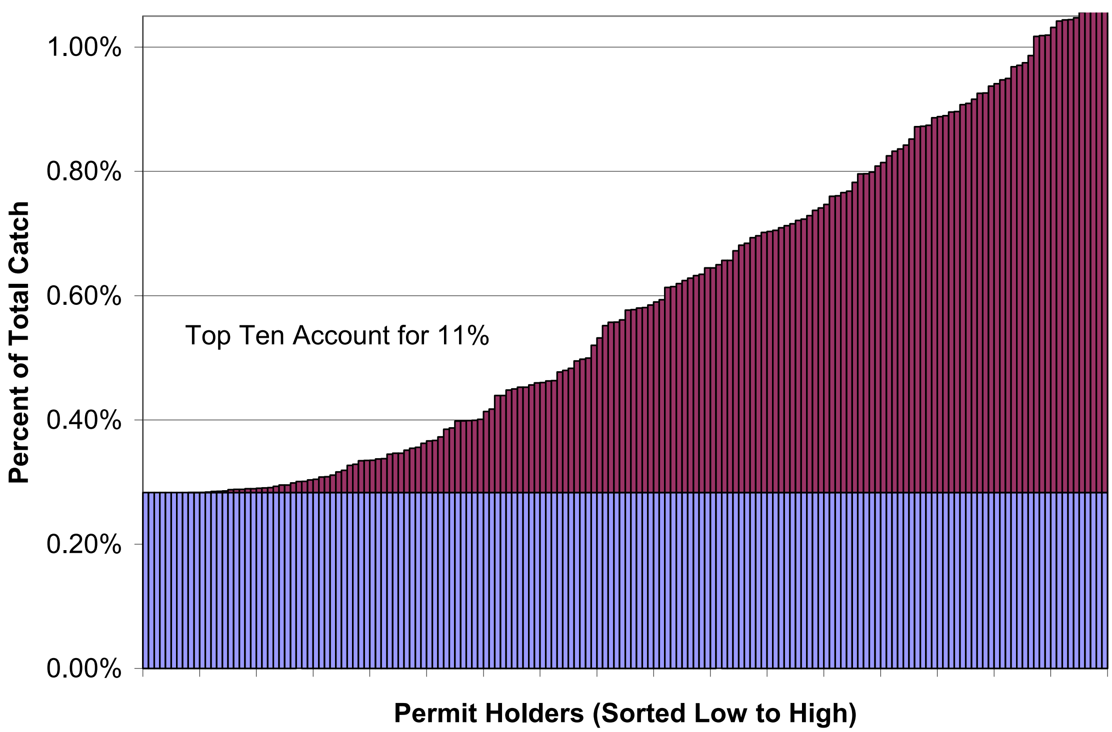


Figure 14-3. Sablefish Catch Distribution—Post Buyback Permit Holders 1994-2003



Note: The set of bars at the bottom of the figures, represent the catch of bought out boats evenly distributed to remaining permit holders. The darker shaded bars represent the actual catch of remaining permit holders. Source: PacFIN data originally provided to Shannon Davis August 2004.

Figure 14-4. Petrale Sole Catch Distribution—Post Buyback Permit Holders 1994-2003

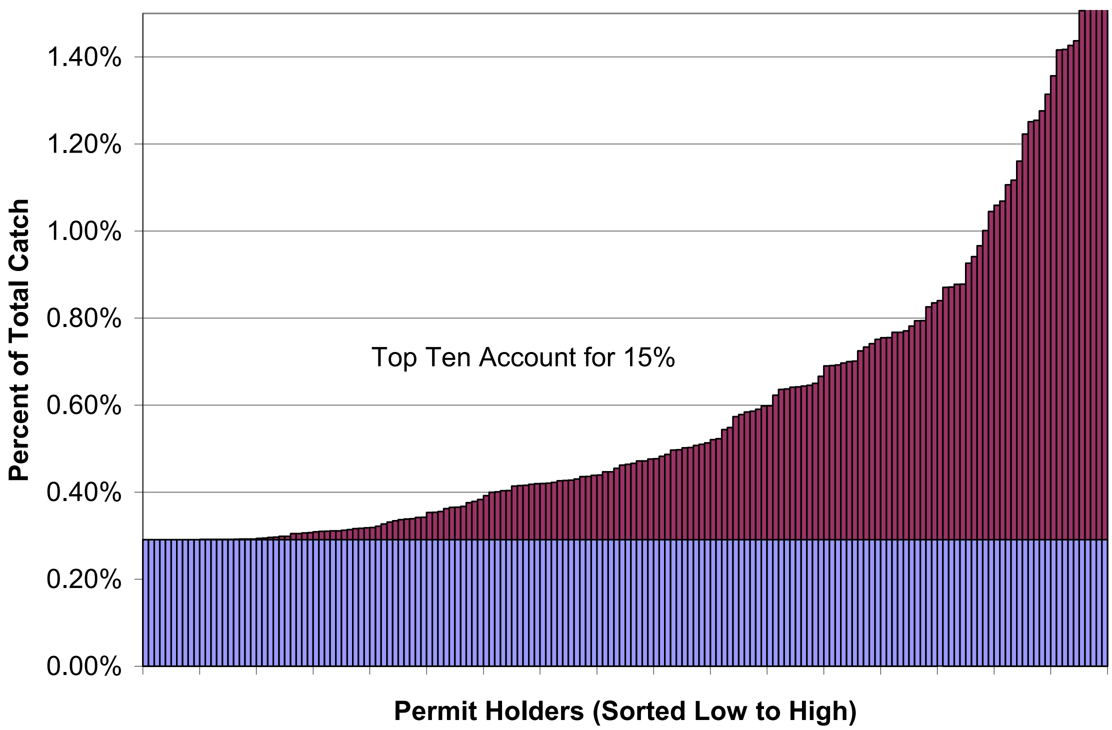
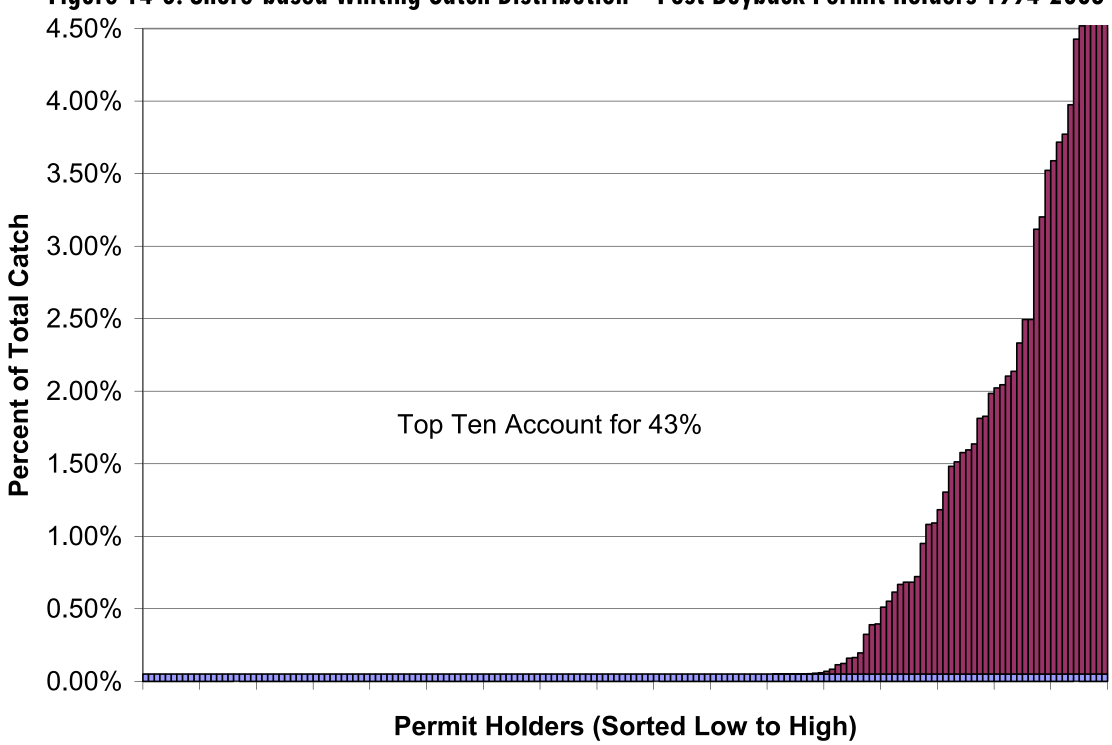


Figure 14-5. Shore-based Whiting Catch Distribution—Post Buyback Permit Holders 1994-2003



Note: The set of bars at the bottom of the figures, represent the catch of bought out boats evenly distributed to remaining permit holders. The darker shaded bars represent the actual catch of remaining permit holders.
Source: PacFIN data originally provided to Shannon Davis August 2004.

Figure 14-6. Canary Rockfish Catch Distribution—Post Buyback Permit Holders 1994-2003

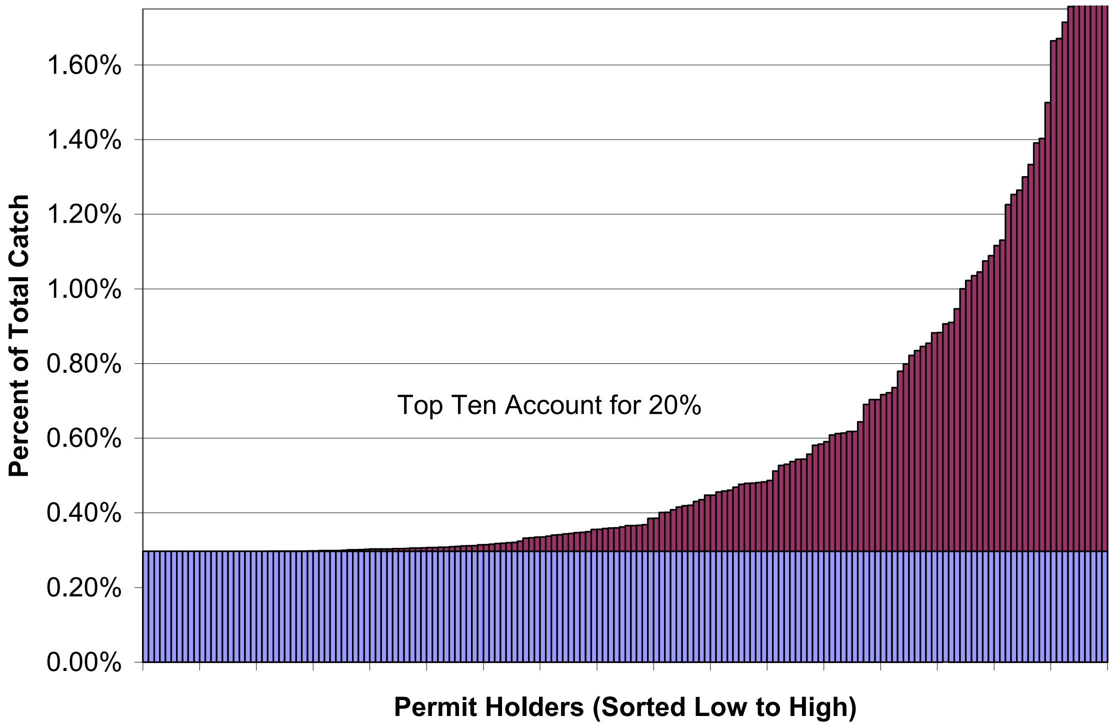
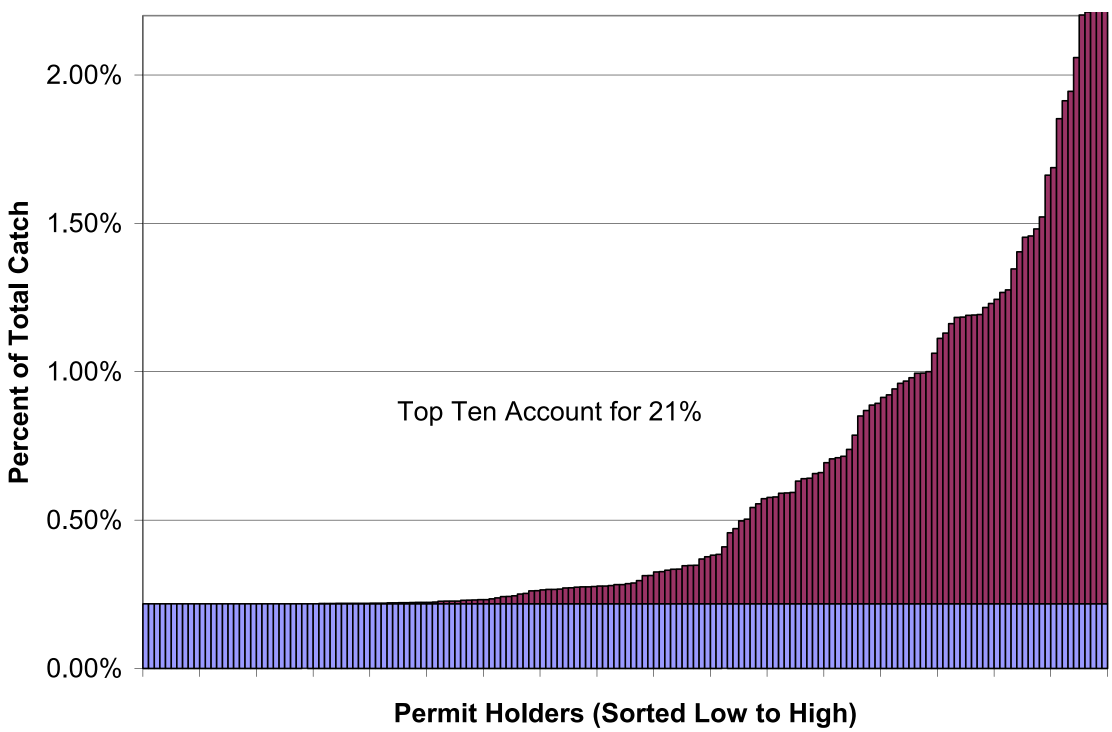


Figure 14-7. Widow Rockfish Catch Distribution—Post Buyback Permit Holders 1994-2003



Not
e: The set of bars at the bottom of the figures, represent the catch of bought out boats evenly distributed to remaining permit holders. The darker shaded bars represent the actual catch of remaining permit holders.
Source: PacFIN data originally provided to Shannon Davis August 2004.

Figure 14-8. Yelloweye Rockfish Catch Distribution—Post Buyback Permit Holders 1994-2003

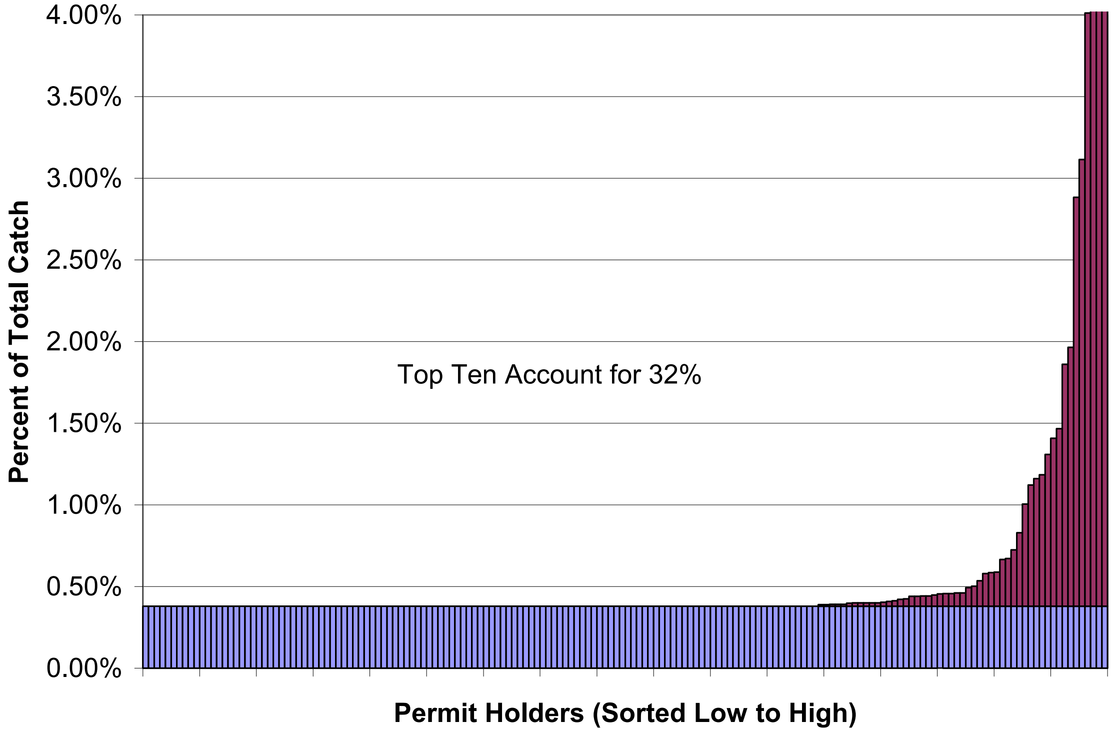
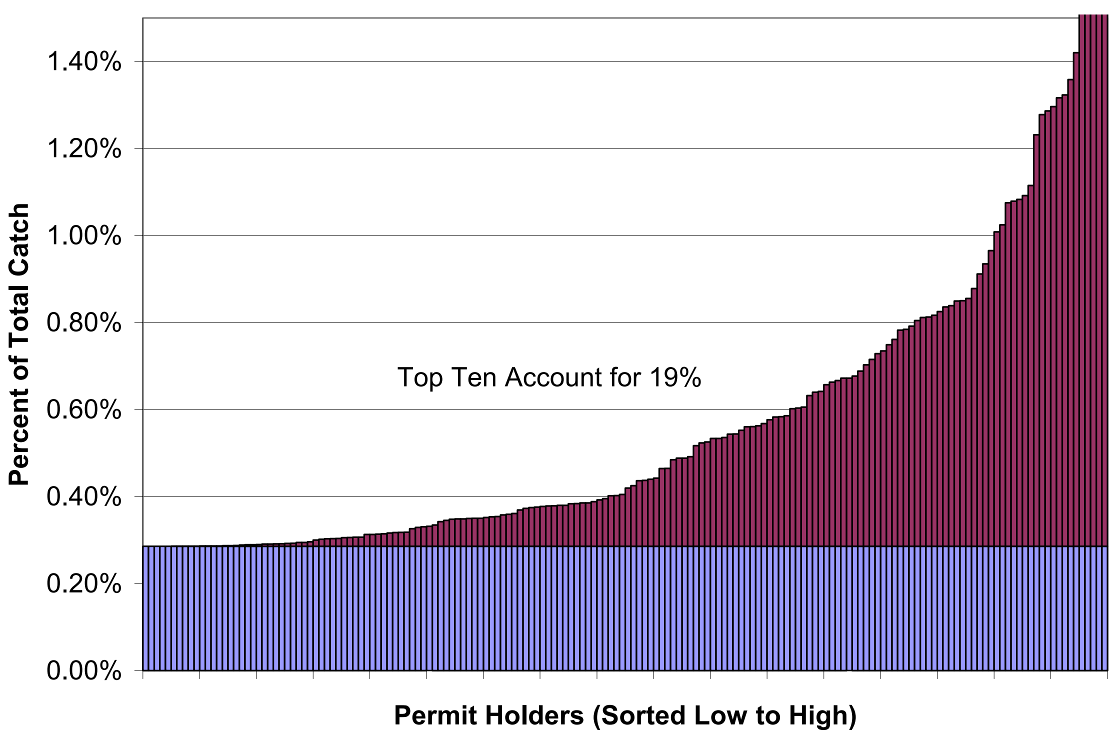


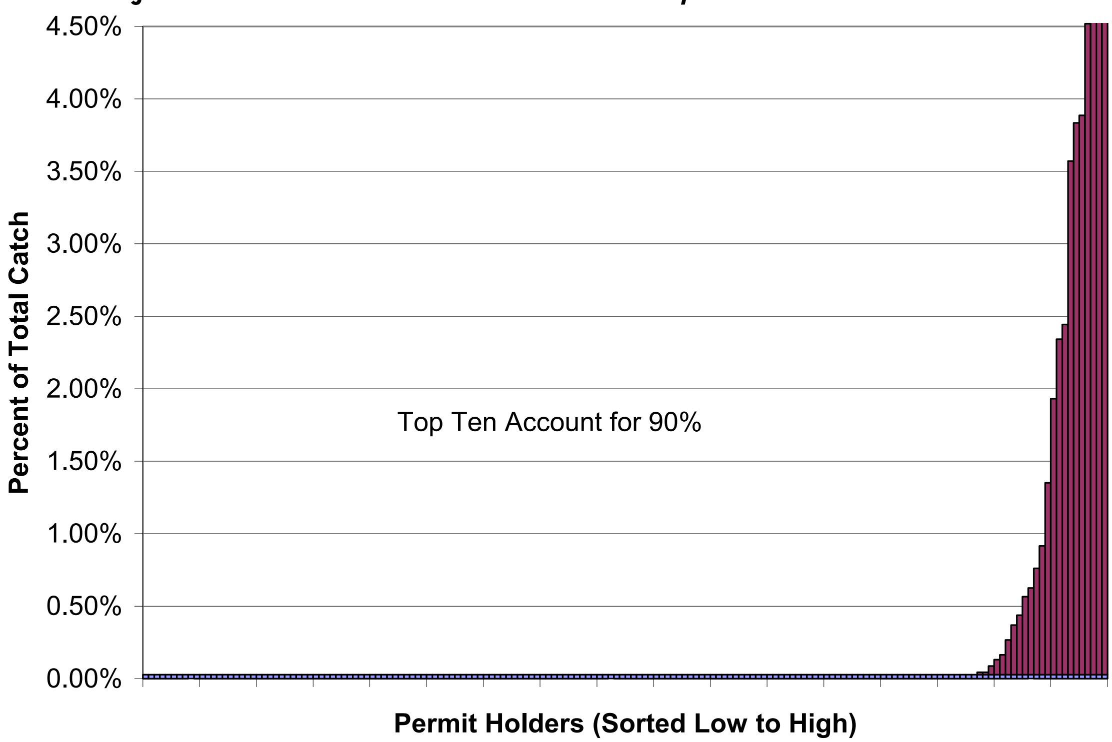
Figure 14-9. Lingcod Catch Distribution—Post Buyback Permit Holders 1994-2003



Note: The set of bars at the bottom of the figures, represent the catch of bought out boats evenly distributed to remaining permit holders. The darker shaded bars represent the actual catch of remaining permit holders.
Source: PacFIN data originally provided to Shannon Davis August 2004.

Figure 14-10. Butter Sole Catch Distribution—Post Buyback Permit Holders 1994-2003

Figure 14-11. Cabezon Catch Distribution—Post Buyback Permit Holders 1994-2003



Note: The set of bars at the bottom of the figures, represent the catch of bought out boats evenly distributed to remaining permit holders. The darker shaded bars represent the actual catch of remaining permit holders.
Source: PacFIN data originally provided to Shannon Davis August 2004.

As might be expected, the figures reveal that the distribution of landings for Dover sole, thornyheads and sablefish (see Figure 14-1 through Figure 14-3) are very similar, as is the relative importance of the re-distribution of landings from bought-out permits. Figure 14-4 which shows the distribution of Petrale sole exhibits a higher level skewness—the more concave the distribution means that a greater percentage of the total landings were made by highliners.

Figure 14-5 shows the distribution of shore-based landings of Pacific Whiting. This figure indicates that a over 2/3^{rds} of the permits remaining after the buyback do not participate in the whiting fishery. The figure also indicate that the top-10 permits accounted for 43 percent of the total after the re-distribution of whiting landings by bought-out permits.

Figure 14-6 through Figure 14-9 show the distribution of landings of four species that are (or have been) declared overfished.[38] The figures all show significant levels of skewness—in particular the distribution of yelloweye rockfish is very highly skewed. All four of these figures clearly demonstrate the potential benefit of the re-distribution of landings from bought out boats. The equal-share re-distribution may provide sufficient amounts of QS to cover incidental catches without forcing vessels to purchase QS from those that had high levels of landings. Referring back to Table 14-1, the approximately 50 percent of the total landings canary rockfish would be re-distributed, while only 37 percent of the widow rockfish would be re-distributed. Whether or not the re-distributed amounts are actually sufficient to cover incidental catches is an empirical question. The figures also show however, that allocating these species using historical landings may provide a significant windfall to permit holders that had high levels of catch of these now-constraining species.

[38] Lingcod is not currently considered overfished, but was considered overfished as late as 2005.

Agenda Item F.3.b
Attachment 1 ERRATA
June, 2006

ERRATA: Replacement Pages 23-36 for
Excerpt from Stage 1 Draft IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery (Chapters 1, 2, 4 and Appendices A-C).

Attached is a revised Table 2-1 (from Agenda Item F.3.b, Attachment 1). The pages immediately preceding and following the table are included to facilitate replacement of the original Table 2-1 with the errata table. The main differences between this and the original version are in the references to the whiting and non-whiting species and segments of the fishery.

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Alternative 4: IFQs for all groundfish species. The distinction between whiting sectors would be eliminated. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. OYs for each of the Other Species of groundfish would be would be established. If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species.

Alternative 5: **Permit stacking.** Groundfish would be managed as under the No-Action Alternative, but limited entry trawl permit holders would be allowed to "stack" additional permits. Permit holders would be issued a full complement cumulative trip limit pounds for each permit they own. Whiting seasons and sectors would be maintained. Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels. Catches of Other Species would be monitored. If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species.

In addition to the various management regimes described above, the three IFQ alternatives (Alternatives 2 – 4) differ with respect to the way in which quota shares are allocated. The Council developed three basic allocations and incorporated them into three IFQ programs (currently labeled Program A, Program B, and Program C). The allocations differ primarily in terms of which groups would receive quota and how much each group would receive. These are summarized below:

Program A: Harvesters and processors are initially allocated equal amounts of QS that give them rights to harvest groundfish. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. Program A would be applied to Alternative 3.

Program B: Harvesters and processors are allocated QS that give them rights to harvest groundfish. Split options include: a) 100/0 for all groundfish, b) 100/0 for non-whiting and 50/50 for whiting, and c) 90/10 for all groundfish. Processors are defined as in the FMP—those facilities that process either unprocessed or already processed groundfish or receive live fish for resale. Program B would be applied to Alternative 3.

Program C: Harvesters and processors are allocated QS that give them rights to harvest groundfish. Harvesters would initially receive 75 percent of the QS and processors would receive the remaining 25 percent. Processors are defined as those facilities that take ownership of and process unprocessed groundfish. Program C would be applied to Alternative 2, 3, and 4.

All three of the programs are applied to Alternative 3 as options. In effect, this generates three new alternatives: Alternatives 3A, 3B, and 3C. In addition it should be noted that Program B contains three different allocation schemes, and that these schemes also have the potential to significantly alter the impacts of the alternative. The end result is that Alternative 3 might reasonably be analyzed as five different alternatives: Alternatives 3A, 3Ba, 3Bb, 3Bc, and 3C.

Table 2-1 and Table 2-2, below, present details of the various elements and options that make up each of the alternatives. The tables are similar to those produced for the Council, and contain references to the IFQ Scoping Results Document[6] and various options described within that document.

[6] National Environmental Policy Act Scoping Results Document: Individual Fishing Quotas (A Kind of Dedicated Access Privilege) and Other Catch Control Tools for the Pacific Coast Limited Entry Trawl Groundfish Fishery. Pacific Fishery Management Council, July 2005.

Table 2-1. Management Regime Alternatives for Analysis

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
			COMPONENT 1: CATCH CONTROL TOOLS		
			IFQ Program for Non-Whiting and Whiting Trips		
Element 1.1 IFQ Program to Be Applied (See Table 2-2)	No IFQ Program.	Program C	Alternative 3A - Program A Alternative 3B - Program B Alternative 3C - Program C	Program C	No IFQ Program.
			Additional Control Tools (Sections 2.1.1.2 of the Scoping Results Document).[a]/		
Element 1.2 Permit Stacking	-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- None -- -- -- -- -- -- -- -- -- -- -- -- -- -- --				One set of trip limits issued for each of a maximum of 3 permits attached to vessel. Only one of the permits attached to the vessel would need to be of the appropriate length.
Element 1.3 Cumulative Trip Limits	Cumulative landing limits. (One set of limits for each vessel to which a permit is assigned.)	Transferable cumulative catch limits.[b]/ Cumulative limits would be transferable on a temporary basis between vessels within the period (full or partial limit transfers would be allowed, depending on length of limit period)	Cumulative catch limits (One set of limits for each vessel to which a permit is assigned.)	None	Cumulative catch limits. (One set of limits for each permit.)

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 1.4 Adjustments for Low OYs					
Allocation	- -- -- -- -- -- -- -- -- The Council may suspend intersector allocations when a species is overfished -- -- -- -- -- -- -- --				
Catch Control Rules	N/A	Adjust rules for low OY conditions (as specified in Component 2). *IFQ species – No change.* *Non-IFQ species – For species meeting the low OY threshold switch from transferable to* ***non****transferable cumulative catch limits.*[c/]	**Option 1**: Adjust rules for low OY conditions (as specified in Component 2). *For low OY species, except whiting, switch from IFQs for that species and instead manage the sector allocation as a pool using nontransferable cumulative catch limits to control catch.*[d/] **Option 2:** No low OY adjustments.	N/A	N/A
Threshold	N/A	Low OY Threshold: Establish a threshold at which point a species would switch to "Low OY management." ($B_{25\%}$)	Low OY Threshold: Decide on application of "Low OY management" as part of the biennial specifications process.	N/A	N/A
Element 1.5 General Season Closures	-- -- -- -- When all sectors in aggregate reach the overall OY for a species, seasons close for the affected species -- -- -- --				
Element 1.6 Whiting Season Openings	Staggered season openings for each whiting sector.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Possible continuation of spring opening for the season, to control impacts on ESA listed salmon.	Same as no action.
Element 1.7 Whiting Season Closings	Whiting season closes for a sector on attainment of whiting allocation. Whiting season closure on attainment of bycatch caps for species with bycatch caps.	Whiting season closure on attainment of bycatch caps for species with bycatch caps.[i/]	Open until end of year.	Open until end of year.	Same as no action

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
COMPONENT 2					
Sector/Species Group Combinations and the Catch Control Tools To Be Applied (Section 2.1.1.3 & 2.1.1.4 of the scoping results document)					
Element 2.1 Sectors Define Whiting Trip: Opt 1-- >50% non-whiting Opt 2-- >50% or >10,000 lbs non-whiting	Three sectors: ▪ shoreside (SS) deliveries ▪ mothership (MS) deliveries ▪ catcher-processor (CP) deliveries	Four sectors: ▪ SS whiting deliveries ▪ SS non-whiting deliveries ▪ MS deliveries ▪ CP deliveries (FROM Scoping Results Doc: 2.1.1.4 Option 3)	Three sectors: ▪ SS deliveries ▪ MS deliveries ▪ CP deliveries (FROM Scoping Results Doc: 2.1.1.4 Option 2)	One sector (FROM Scoping Results Doc: 2.1.1.4 Option 1)	Three sectors: ▪ SS deliveries ▪ MS deliveries ▪ CP deliveries
Element 2.2 Primary Trawl Target and Allocated Species[e/] **(Except Whiting)**	All sectors: cumulative landing limits. Trawl fishery closes on attainment of cap, guideline or OY. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species.	SS non-whiting deliveries: IFQs SS, MS, & CP whiting deliveries: catch caps for these species. A sector's whiting seasons close on attainment of that sector's whiting fishery catch cap for non-whiting species. No cumulative catch limits. Midseason rollovers for excess cap amounts and augmentation of caps thru acquisition of SS IFQ.	Sector specific IFQs (Low OY Conditions: Option 1: switch to nontransferable cumulative catch limits and close on attainment of sector limits; Option 2: continue use of IFQs.)	IFQ	Cumulative catch limits with permit stacking rules applied for non-whiting trips. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species. Stacked permits may not be used to cover catch on whiting trips.
Element 2.3 Whiting	All sectors: Whiting season (no vessel landing limits). Outside the whiting season shoreside deliveries allowed under cumulative whiting landing limits. Midseason rollover of excess allocation to another sector.	SS nonwhiting deliveries: Whiting catch must be covered with IFQ and is also constrained year-round by nontransferable cumulative whiting catch limits. SS, MS, & CP whiting deliveries: IFQs during whiting season. Midseason whiting rollover to another sector Opt 1: Not allowed; Opt 2: Allowed following specified procedures.	Sector specific IFQs during the whiting season. If SS whiting is closed SS whiting IFQs may continue to be used, subject to nontransferable cumulative whiting catch limits.	IFQs during the whiting season. IFQs and nontransferable cumulative whiting catch limits for shoreside deliveries outside the whiting season.	All sectors: Whiting season (no vessel landing limits). Outside the whiting season shoreside deliveries allowed under cumulative whiting catch limits. Permit stacking rules do not apply for cumulative whiting limits. Midseason rollover of excess allocation to another sector.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 2.4 Unallocated Shared Target and Incidental Species Currently Managed With Cumulative Limits	All sectors: cumulative landing limits Trawl fishery closes on attainment of cap, guideline or OY. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species.	SS whiting deliveries Transferable cumulative catch limits. Option for >2 mo cumulative periods and midperiod transfers. (Low OY conditions: switch to nontransferable cumulative catch limits) SS, MS, & CP whiting deliveries For species without caps: non-whiting species catch is limited by to a single cumulative catch limits regardless of the number of transferable limits held by a vessel. For non-whiting species with caps, same as Element 2.2.	Sector specific IFQs. (Low OY Conditions: Same low OY condition options as for "Primary Trawl Target and Allocated Species" (Element 2.2))	IFQ	Cumulative catch limits with permit stacking rules applied for non-whiting trips. Whiting season closes on attainment of whiting fishery bycatch cap for non-whiting species. Stacked permits may not be used to cover catch on whiting trips.
Element 2.5 "Other Fish" Groundfish[f/g/]	Status Quo. Currently: monitoring only. May change to cumulative limits.	Same as status quo.[h/]	Same as status quo.[h/]	IFQ	Same as status quo.[h/]
Component 3: Groundfish Catch of Limited Entry Trawl Vessels Using Gears Other Than Groundfish Trawl (Section 2.1.1.5 of the Scoping Results Document)					
Element 3.1 **Trawl Vessel Exempted Gear Quota Accounting and Catch Control (Includes Exempted Trawl and Exempted Non-trawl Gears)**	**Exempted gea**r catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[i/] but is subject to open access (OA) trip limits.	**Exempted gear** - IFQ is **not** required. Catch counts against the OA allocation and is managed as part of the OA fishery. Some catch will be allocated from the LE trawl to OA fishery. (FROM Scoping Results Document Section 2.1.1.5 Opt 2C)	**Exempted gear -** IFQ required. Catch counts against LE Trawl. Open access catch control regulations apply. (FROM 2.1.1.5 Scoping Results Document Section Option 1A)	**Exempted gear -** IFQ required. Catch counts against LE Trawl. Open access trip limits **do not** apply. (FRM 2.1.1.5 Scoping Results Doc Option 1B)	**Exempted gea**r catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[h/] but is subject to open access (OA) trip limits OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Element 3.2 **Trawl Vessel Longline and Fish Pot Without and With LE Endorsement (Fixed Gear Quota Accounting and Catch Control)**	**Unendorsed longline & fishpot** catch by LE trawl vessels counts against LE allocation (trawl and fixed gear)[i/] but is subject to open access trip limits. **LE endorsed fixed gear** - Rules for the LE fixed gear fishery apply when the vessel is using fixed gear. Vessels fish against the limited entry allocation[i/] and are constrained by fixed gear trip limits while using fixed gear.	**Unendorsed longline & fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed gear catch control regulations apply. **LE endorsed fixed gear –** While using fixed gear, IFQ is not required, catch is constrained by LE fixed gear limits and counts toward the LE fixed gear allocation. (FROM 2.1.1.5 Scoping Results Doc, Option 1A)	**Unendorsed longline and fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed catch control regulations **do not** apply. **LE endorsed fixed gear –** While using fixed gear, IFQ is not required for catch taken toward LE fixed gear cumulative or daily limits and such catch counts toward the LE fixed gear allocation. Catch in excess of LE fixed gear trip limits may be taken if covered by trawl IFQ. (FROM 2.1.1.5 Scoping Results Doc, Opt 1B)	**Unendorsed longline & fishpot** - IFQ required. Catch counts against LE Trawl. LE fixed catch control regulations **do not** apply. **LE endorsed fixed gear** - While using fixed gear, IFQ is not required for catch taken toward LE fixed gear cumulative or daily limits and such catch counts toward the LE fixed gear allocation. Catch in excess of LE fixed gear trip limits may be taken if covered by trawl IFQ. (FRM 2.1.1.5 Scoping Results Doc, Opt 1B)	**Unendorsed longline & fishpot** catch by LE trawl vessels counts against LE allocation[i/] (trawl and fixed gear)[i/] but is subject to open access trip limits. OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions. **LE endorsed fixed gear** - When the vessel is using fixed gear catch counts against the LE allocation[i/] and is constrained by fixed gear limits. OR Permit stacking applies and vessels must comply with trawl enforcement and monitoring provisions (except when fishing fixed gear tier limits).
Component 4. Monitoring and Enforcement					
At-sea Observers/ Monitoring	Biological observers on some SS catcher vessel trips, 100% observers for at-sea deliveries (MS and CP)	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4).	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4)	100% at-sea monitoring. Detailed monitoring and enforcement provisions under each IFQ program (Tables 2-2 and 2-4)	100% at-sea monitoring.

Alternatives (Sec 2.1.1.1 Scoping Results[a/])	Alternative 1 No-Action Alternative	Alternative 2 IFQs for Trawl Target Groundfish	Alternative 3 IFQs for All Groundfish Except Other Fish	Alternative 4 IFQs for All Groundfish	Alternative 5 Cumulative Catch Limits and Permit Stacking
Component 5. Area Management (Decision Table B from Scoping Results Document)					
	Species divided by areas based on stock assessment information. New area divisions created as stock assessment information indicates need.	Program Option for All Action Alternatives: Plan to establish additional regional management areas as needed at a later time. Provisions are included to allow later subdivision of IFQs by area. Process Option: Task a group to begin considering the need for additional regional management areas (biological or socio-economic) and potential boundaries along with a process for identifying and responding to regional management area issues that may develop or become more apparent in the future. **Decision deferred until additional information is available, e.g. preliminary DEIS is ready.**			
Component 6. Sector Allocation					
Element 6.1 Within Trawl (Decision Table E from Scoping Results Document)	Whiting allocation rules. No other within trawl allocations.	Establish within trawl allocations based on each sector's relative shares during the time period used for initial allocation. If time periods are different for different sectors use only those years in common to all sectors or calculate a percentage based on each sectors period then adjust all sectors proportionally so that the result sums to 100%. Consider applying the IFQ allocation recency requirement (if any) to eliminate from the sector calculation the catch history of any vessel that has not been active in recent years.			Whiting allocation rules. No other within trawl allocations.
Element 6.2 Trawl/All-Other-Gear		Establish needed intersector allocations through the intersector allocation process.			
Element 6.3 Trawl/ Open Access	N/A	Augment the open access allocation to account for trawl vessels fishing with open access gear on the open access allocation (Element 3.1)	N/A	N/A	N/A

Table 2-2. IFQ Program Design Alternatives for Analysis

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.0 IFQ Allocation			
B.1.1 Eligible Groups	Allocate 50% of quota shares to current permit owners and 50% to processors (Option 3b).[7]	Eligible Group Suboption B-1. Allocate 100% of quota shares to current permit owners (Option 1 from Appendix B). Eligible Group Suboption B-2. Allocate 100% of quota shares for non-whiting species to current permit owners and 50% of the quota shares for whiting species to current permit owners. Allocate 50% of the quota shares for whiting species to processors. (New Option, June 2005) Eligible Group Suboption B-3. 90% of quota shares to current permit owners and 10% to processors. (New Option, June 2005).	Allocate 75% of quota shares to current permit owners and 25% to processors (Option 3a).
Processor Definition:	Use special IFQ Program definition (processors: receive and process unprocessed fish; or catch and process) (Option 1).	Use FMP Definition (processors process unprocessed and already processed fish or receive live fish for resale) (Option 2).	Same as Program A.

[7] References to Options refer to options at they were described in the Scoping Results Document, i.e. *National Environmental Policy Act Scoping Results Document: Individual Fishing Quotas (A Kind of Dedicated Access Privilege) and Other Catch Control Tools for the Pacific Coast Limited Entry Trawl Groundfish Fishery*. Pacific Fishery Management Council, July 2005.

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.2 Qualifying Criteria: Recent Participation	**Harvesters (including catcher-processors):** 1998-2003 participation required in order to qualify for an initial allocation of quota shares (number of trips or years to be specified). (Option 2). **For shoreside processors and motherships:** 1999-2004 recent participation requirement (the number of trips or years is yet to be specified). (Option 4).	All Members of Eligible Groups: No recent participation required in order to qualify for an initial allocation of quota shares (Option 1). **OR** All Members of Eligible Groups: 1998-2003 participation required (one trawl groundfish landing/delivery of any groundfish species) in order to qualify for an initial allocation of quota shares. (Option 2).	Same as Program A.
B.1.3 Elements of the Allocation "Formula"			
Vessel/Permit Related Allocation	Catcher vessel permit owners will receive quota shares based on their permit history plus an equal division of the quota that could be attributed to permit history of bought-back permits (catcher-processors permit owners will not receive a portion of the quota shares distributed on an equal sharing basis) (Option 2). Suboptions for incidentally caught overfished species, either: (a) same as for Other Fish OR (b) equally divide quota for incidentally caught overfished species. For catcher-processors permit owners, use an allocation schedule developed by unanimous consent of that sector (to be provided).	Same as Program A, except no special catcher-processor schedule.	Same as Program A.
Processor Allocation	Processors are allocated quota shares based entirely on the processing of groundfish trawl landings received unprocessed (Option 1).		
B.1.4 History: Species/Species Groups to Be Used for Allocation	Allocate Quota Shares Based on Individual Species/Species Groups: Allocate quota shares for each species/species group based on relative amounts of each respective species/species group caught/landed or processed - for permits applies to permit history; for processors applies to amounts processed (Option 2).		

	IFQ Program A	IFQ Program B	IFQ Program C
B.1.5 History: Allocation Periods			
Periods/Years to Drop:	Options are identical under all programs. Vessels: 1994-2003. Drop 2 years for whiting sector fishing (applies to incidental harvest and whiting). Drop 3 years for non-whiting sector fishing. (Option 1, Sub-option B) Shore Processors: 1999-2004. Drop 2 years. (Option 5, Sub-option B) Motherships: 1998-2003. No opportunity to drop worst year. (Option 4, Sub-option A)		
Weighting Among Years:	Absolute pounds - no weighting between years (Sub-option (i)).	Relative pounds (calculate history based on the entity's percent share of each year's total) (Sub-option (ii)).	Same as Program B
B.1.6 History: Combined Permits and Other Exceptional Situations			
Combined permits:	All permits count. History of the permits combined into a single permit goes to the resulting permit (Option 1).		
Illegal landings/catch:	Don't count Illegal landings/catch under any program.		
Landings in excess of trip limits, as authorized under an EFP:	Don't count landings in excess of the cumulative limit in place for the non-EFP fishery under any program		
Compensation fish:	Don't count compensation fish under any program.		
B.1.7 Initial Issuance Appeals Process	Only one provision has been identified: Appeals would occur through processes developed by NMFS. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Any proposed revisions to fish-tickets would undergo review by state enforcement personnel prior to finalization of the revisions.		
B.1.8 Creating New IFQ Species/Species Groups After initial Implementation	Only one practical option has been identified: When a management unit is subdivided, quota shares for that unit will be subdivided by issuing quota share holders amounts of shares for the subdivisions equivalent to their holdings of the shares being subdivided. If a new management unit is established that is not a subset of an existing unit managed with IFQ, the Council will need to take action at that time to develop criteria for quota share allocation.		
B.2.0 IFQ/Permit Holding Requirements and IFQ Acquisition (After Initial Allocation)			
B.2.1 IFQ and LE Permit Holding Requirements	Catch must be covered with quota pounds within 30 days of the landing (Option 3). Only LE trawl vessels would be allowed to participate in the IFQ fishery. For any vessel with an overage (landings not covered by quota) there would be no more fishing by the vessel until the overage is covered. Additionally, for vessels with an overage, the limited entry permit cannot be sold or transferred until the deficit is cleared. A possible suboption would require some amount of quota pounds be held prior to departure from port (to be analyzed).		
B.2.2 Annual IFQ Issuance			
B.2.2.1 Start-of-Year Quota Pound Issuance	Only one practical option has been identified: Quota pounds are issued annually to share holders based on the amount of quota shares they held. (Quota shares are issued at the time of initial IFQ allocation).		

	IFQ Program A	IFQ Program B	IFQ Program C
B.2.2.2 Rollover (Carryover) of Quota Pounds to a Following Year			
Non-overfished Species	10% rollover for non-overfished species (Option 3)	30% rollover for non-overfished species (Option 5)	5% rollover for non-overfished species (Option 2)
Overfished Species	5% rollover for overfished species (Option 3)	Full (30%) rollover allowance for overfished species (Option 5)	No rollover allowance for overfished species (Option 2)
B.2.2.3 Quota Share Use-or-Lose Provisions	Do not include a use-or-lose provision but evaluate need as part of future program reviews (Option 3).		
B.2.2.4 Entry Level Opportunities for Acquiring Quota Shares and Low Interest Loan Options	No special provisions.	No special provisions.	Provide new entrants an opportunity to qualify for revoked shares and shares lost due to non-use (if such non-use provisions are created) (Element 2)
B.2.2.5 Community Stability Hold Back	No special provisions.	No special provisions.	Set aside up to 20% of the non-whiting shoreside trawl sector allocation each year and allocate to IFQ holders who have submitted proposals, ranked on the basis of objective criteria that evaluate benefits to local communities.
B.2.3 Transfer Rules			
B.2.3.1 Eligible Owners/Holders (Who May Own/Hold)	Any entity eligible to own or operate a US documented fishing vessel. (Option 2) *The Trawl IQ Committee's intent is to preserve opportunity for existing participants*		
B.2.3.2 Duration of Transfer - Leasing and Sale	Permanent transfers and leasing of quota shares and quota pounds allowed. (Option 2)	Permanent quota share transfers only--leasing prohibited. Permanent transfers and leasing of quota pounds allowed. (Option 1)	Same as Program A
B.2.3.3 Limits on Time of Transfer	Allow transfers of quota shares any time during year (Option 1).	Prohibit transfer of quota shares during the last two months of the year.	Same as Program A
B.2.3.4 Divisibility	Only one practical option has been identified: Quota Shares: nearly unrestricted divisibility - "many decimal points." Quota Pounds: divisible to the single pound		
B.2.3.5 Liens	No options have been proposed to restrict liens. Liens can and should be facilitated through a central lien registry. Options for the central lien registry are covered in Section B.3.1.		

	IFQ Program A	IFQ Program B	IFQ Program C
B.2.3.6 Accumulation Limits	50% or No Limits (Option 5).	Consider all limits as sub-options	Most restrictive limits (1% or 5%) **OR** Intermediate level limits (10% or 25%)
B.2.3.7 Vertical Integration Limit	Only one option has been identified: No additional limits on vertical integration beyond those already provided through accumulation limits.		
B.3.0 Program Administration			
Tracking IFQ, Monitoring Landings, and Enforcement (see Table B.3-1)			
Enforcement Program Number	**Enforcement Program 2**	**Enforcement Program 1**	**Enforcement Program 3**
At-Sea Monitoring	100% at-sea monitors (observers)	100% at-sea monitors (observers)	100% at-sea monitors (observers) or cameras
Shoreside Monitoring	Shoreside monitoring opportunity would be provided	100% shoreside monitoring	Shoreside monitoring opportunity would be provided
Retention and Discards	Discards allowed	Full retention required	Discards allowed if at-sea monitor is present (otherwise full retention)
Discard Monitoring and Reporting System	Upgraded discard (bycatch) monitoring and reporting system needed	An upgraded discard monitoring and reporting system is un-needed	Upgraded discard (bycatch) monitoring and reporting system needed
Electronic Reporting	Electronic landings tracking. QS reported electronically.	Electronic landings tracking. QS reported electronically.	Parallel federal electronic landings tracking. QS reported electronically.
Landing Notification	Advance notice of landing required.	Advance notice of landing required	Advance notice of landing required
Potential Landing Times	Unlimited landing hours	Limited landing hours	Unlimited landing hours
Potential Landing Sites	Licenses required for delivery sites	Unlimited landings sites	Licenses required for delivery sites
Vessel Monitoring System (VMS)	VMS Required under all programs	VMS Required under all programs	VMS Required under all programs
Quota Share Tracking	Create a central lien registry but exclude all but essential ownership information. (Option 2).	Create a central lien registry including all related ownership information (Option 1).	Create a central lien registry including all related ownership information (Option 1).

	IFQ Program A	IFQ Program B	IFQ Program C
B.3.2 Cost Recovery/Sharing and Rent Extraction	Cost recovery for management (not enforcement or science). Up to 3% of ex-vessel value, the limit specified in the Magnuson-Stevens Act.	Same as Program A	Full cost recovery: Landings fee plus privatization of elements of the management system. In particular, privatization for monitoring of IFQ landings (e.g., industry pays for their own compliance monitors). Stock assessments should not be privatized and the electronic fish ticket system should not be privatized.
B.3.3 Program Duration and Procedures for Program Performance Monitoring, Review, and Revision (Magnuson-Stevens Act (d)(5)(A))	A four year review process is specified along with review criteria. Among other factors, the review would include evaluation of whether or not there are localized depletion problems and whether or not quota shares are being utilized. Standard fishery management plan and regulatory amendment procedures will be used to modify the program.		
B.3.4 Data Collection	Expanded voluntary submission of economic data (Option 2).	Expanded mandatory submission of economic data (Option 1).	Same as Program B

2.2 Alternatives Considered but Excluded from Detailed Analysis

This section discusses an alternative that was considered but rejected and briefly explains the reasons for its elimination. In addition, this section lists options and sub-options that were considered by the Council and TIQC but were not included in any of the alternatives forwarded for analysis.

An alternative that was initially considered for analysis would issue IFQs for overfished species, maintain cumulative trip limits for all other species, and implement total catch reporting and 100 percent at-sea monitoring. Upon further consideration it was determined that this alternative would not have the potential to create enough benefits to the groundfish fishery to offset the costs of the monitoring and reporting requirements, and questions were raised as to how the program would continue once overfished species recovered. Therefore, the alternative was dropped from further consideration.

In addition to the dropped alternative, a number of options and sub-options were discussed by the Council and TIQC but not included in the alternatives forwarded for analysis. The list below provides an initial summary of these excluded elements and options.

- Species groups that could be managed under an IFQ program but were not explicitly included
    - Overfished Species
    - Prohibited Species
- Stakeholder groups that were not included as recipients of QS
    - Vessel crew members and skippers
    - Vessel owners
    - Communities
- Methods for issuing QS that were not included
    - Auctions
    - Lotteries
    - Equal shares
    - QS based strictly on years of participation
- Types of shares from an IFQ program that might have been forwarded but were not
    - Shares for Processing (as opposed to IFQs for harvesting issued to processors)

While the elements and options listed above were not specifically included in the suite of alternatives that were forwarded for full analysis, all are included in the description of components, elements and options (Section 2.3).

2.3 Components Table

Before the effects of the alternatives on resources and stakeholders of concern can be fully evaluated a number of issues need to be addressed and decisions may need to be made by the Council. The Components Table below highlights these issues by augmenting the basic alternatives forwarded by the Council for detailed analysis. The major goal of the Components Table and the Components Analysis (see Appendix C: Components Analysis) is to ensure that the details of each alternative are adequately considered by clearly specifying how the different elements fit together within an alternative and identifying unknown or unintended potential effects on resources and stakeholders groups. The Components Table and Components Analysis also identify options that were discussed but not brought forward for detailed analysis.

Trawl Individual Quota Analysis: Workshop Report

Draft

Prepared for the

Pacific Fishery Management Council

May 2006

Prepared by

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Contents

Appendix A: Workshop Presentations

1 Introduction

On April 18 – 20, 2006, the Pacific Fisheries Management Council held a three-day workshop on the proposed approach for analysis of fishery management alternatives and completion of an Environmental Impact Statement (EIS) for members of the harvesting and processing community. The goals were to:

- Provide participants, decision-makers and other members of the public with a better understanding of the potential methods to be used to analyze impacts resulting from implementation of a Trawl Individual Quota Program and assistance to preparers of the EIS to ensure the project is accomplished in full compliance with the National Environmental Protection Act (NEPA) and its implementing regulations,
- Provide participants with an opportunity to share information with the project team that may assist in understanding potential effects of these alternatives.

1.1 Day 1 Overview:

The workshop began with introductions, an overview of the workshop, and a discussion of workshop goals and objectives. After lunch, the consultant team presented an overview of the Stage 1 Draft Report with a particular emphasis on the analytical framework and the Proposed Alternatives. The presentation was structured with opportunities for participants to ask questions and make comments throughout the presentation.

1.2 Day 2 Overview:

The second day of the workshop featured two small group break-out discussions. The morning session focused on Permit Stacking (Alternative 5); while the afternoon session focused on Alternatives 3 and 4. Permit Stacking was chosen as the first topic because it closely resembles the status quo, and thus the changes from status quo will be less noticeable relative to Individual Fishing Quota (IFQ) management. Alternatives 3 and 4 were chosen to address potential results from various management changes involving IFQs. During the small group discussions, workshop participants were divided into 3 groups that discussed these issues. The full workshop then reconvened and each group provided a summary of their discussions to the workshop as a whole. The break-out discussion topics were chosen by the project team with the intent of allowing workshop participants to discuss their views on potential outcomes of the action alternatives.

1.3 Day 3 Overview:

The third day of the workshop featured a large group presentation and discussion of defining the term 'processor' as it relates to each of the proposed alternatives. This session was followed by a large group presentation and discussion on community issues. These topics were prioritized based, in part, on input from workshop participants. The last session of the workshop included a wrap-up session, summarizing the key points that were taken from workshop discussions and finished with a brief overview of the next steps of the project.

Workshop Agenda

From	To	Activity
Tuesday, April 18, 2006		
From	**To**	**Activity**
9:30 AM	10:00 AM	Coffee and greetings
10:00 AM	10: 30 AM	Workshop Begins: Introductions and Project Background
10:30 AM	10:45 PM	Workshop overview and agenda review – Marcus
10:45 AM	11:15	Alternatives as forwarded by Council and as Currently Listed
11:15 AM	12:00 PM	Discussion of workshop goals & objectives
12:00 PM	1:00 PM	Lunch
Discussion Topic: Presentation of Stage 1 Draft by consulting team		
1:00 PM	3:00 PM	Analytical Framework / Affected Stakeholders and Resources
3:00 PM	3:30 PM	Break
3:30 PM	5:00 PM	Components Table and Major Analytical Issues
5:00 PM	5:30 PM	Large Group Discussion, Questions, and Answers
Wednesday, April 19, 2006		
From	**To**	**Activity**
8:00 AM	8:15 AM	Coffee
Discussion Topic: Effects of the No Action Alternative and Permit Stacking (Alternative 5)		
8:15 AM	9:00 AM	Presentation from the Consulting Team on the Analysis of these Alternatives
9:00 AM	9:15 AM	Goal and Objectives for Small Group Discussions
9:15 AM	10:30 AM	Small group discussion re. No-Action Alternative and Permit Stacking
10:30 AM	10:45 AM	Break
10:45 AM	12:00 PM	Small groups report back to entire workshop with large group discussion
12:00 PM	1:00 PM	Lunch
Discussion Topic: Effects of IFQ Alternative 4 (Simplest IFQ program)		
1:00 PM	1:45 PM	Presentation from the Consulting Team on IFQ Alternatives
1:45 AM	2:00 AM	Goal and Objectives for Small Group Discussions
2:00 PM	3:15 PM	Small group discussion re. IFQ Alternatives
3:15 PM	3:30 PM	Break
3:30 PM	5:00 PM	Small groups report back to entire workshop with large group discussion
5:00 PM	5:30 PM	Large Group Discussion, Questions, and Answers
Thursday, April 20, 2006		
From	**To**	**Activity**
8:00 AM	8:15 AM	Coffee
Discussion Topic: Processor Definitions, Allocations, and Impacts		
8:15 AM	8:45 AM	Initial discussion/presentation by Consulting Team
8:45 AM	9:45 AM	Large group discussions
9:45 AM	10:00 AM	Break
Discussion Topic: Community Impacts Consolidation		
10:00 AM	10:30 AM	Initial discussion/presentation by Consulting Team
10:30 AM	11:15 AM	Small group discussions
11:15 AM	12:00 PM	Small groups report back to entire workshop
12:00 PM	1:00 PM	Lunch
Discussion Topic: Consolidation		
1:00 PM	1:30 PM	Initial discussion/presentation by Consulting Team
1:30 PM	2:15 PM	Small group discussions
2:15 PM	3:00 PM	Small groups report back to entire workshop
3:00 PM	3:30 PM	Break
Discussion Topic: Review of Workshop and Next Steps		
3:30 PM	5:00 PM	Wrap-Up Session

1.4 Report Contents:

The workshop report provided here presents a summary of workshop. Most of the workshop sessions consisted of a *Microsoft PowerPoint* presentation by the Consulting Team during which questions were taken and answers provided. The presentations are reproduced in Appendix A, while the questions and comments raised by participants and the responses of project team are contained in the main body of this report.

2 Morning Session, Day 1: Workshop Goals and Objectives/ Presentation of Alternatives

2.1 Introductions of Workshop Participants

Day 1 began with an introduction to the TIQ Project, History, and Project Schedule by Jim Seger, followed by an introduction of the Project Team and Workshop participants. A list of workshop participants is provided in Table 1. The Project team referred to in this document consists of Jim Seger, PFMC project manager the project consulting team.

Table 1. Attendees at the Trawl IQ Workshop

Name	Affiliation	Stakeholder Group	Council Body	Tu.	We.	Th.
Bersch, Joe	Supreme Alaska Seafoods	Mothership	None	Yes	Yes	Yes
Bodnar, Steve	Coos Bay Trawlers Association	Trawl Representative	TIQC	Yes	Yes	Yes
Burke, Denny	F/V Timmy Boay	Trawl/Combo Vessel Owner	None	Yes	Yes	Yes
Campbell, Carl		Commercial Fisherman	None	Yes	Yes	Yes
Carroll, Richard	Ocean Gold Seafoods	Processor	None	Yes	Yes	Yes
Cleary, Dave	Oregon State Police	Enforcement	EC	Yes	Yes	Yes
Cobb Lessa	Port Orford Ocean Resource Team	Community	None	No	No	Yes
Cooper, Mark	Midwater Trawlers Cooperative	Trawl Vessel Owner	None	Yes	Yes	Yes
Corrigan, Brian	USCG	Enforcement	EC	Yes	Yes	No
Craford, Kent	Consultant, WCSPA	Processor	None	Yes	Yes	Yes
Cramer, June		License Owner	None	Yes	Yes	Yes
Cramer, Leo		License Owner	None	Yes	Yes	Yes
Dalton, Mike	CSU, Monterey Bay	Tech – Economist	SSC	Yes	Yes	Yes
Daspit, William	PSMFC	Tech—Data Systems	None	Yes	Yes	Yes
Dooley, Robert		Trawl Vessel Owner	None	No	Yes	Unk.
Dunn, Kevin	F/V Iron Lady	Trawl Vessel Owner	None	Yes	Yes	Yes
Easly, Otha	NMFS, SWR, OLE	Enforcement	EC	Yes	Yes	Yes
Fosmark, Kathy	Nontrawl Vessel Owner	Open Access Gear—Southern	GAP	Yes	Yes	Yes
Fujita, Rod	Environmental Defense	Environmental	None	Yes	Yes	Yes
Garbrick, Chris	United Catcher Boats	Trawl Vessel Owner	TIQC	Yes	Yes	Yes
Ghio, Tom	Ghio Fish Company	Fixed Gear/Buyer	GAP	Yes	No	No
Goblirsch, Ginny	Ex-Sea Grant and Fisherman	Communities	TIQC	Yes	Yes	Yes
Green, Don		Trawl Permit Holder/Fisherman	None	Yes	Yes	Yes
Hightower, Alan		Trawl Vessel Owner	TIQC	Yes	Yes	Yes
Hughes, Steve	NRC/United Catcher Boats	Trawl Representative	None	No	Yes	Yes
Hutala, Peter	Pacific Marine Conservation Coalition	Environmental	None	Yes	Yes	Yes
Jagielo, Tom	WDFW	Tech – Biologist	SSC	Yes	Yes	Yes
Jinks, David	Midwater Trawlers Cooperative	Trawl Vessel Owner	None	Yes	Yes	Unk.
Joner, Steve	Makah Tribe	Tribal Representative	TIQC	Yes	Yes	Yes
Kujala, Paul		Trawl Vessel Owner	None	Yes	Unk.	Unk.
Larkin, Marion		Trawl Vessel Owner	GAP/TIQC	Yes	Yes	Yes
Leipzig, Peter	Fishermen's Marketing Association	Trawl Representative	TIQC	Yes	Yes	Yes
Letourneau, Mike	EPA	Tech—Environmental Review	None	Yes	Yes	Yes

Name	Affiliation	Stakeholder Group	Council Body	Tu.	We.	Th.
Lowman, Dorothy	Consultant, Environmental Defense	Environmental	TIQC	Yes	Yes	Yes
Mann, Heather	Consultant, WCSPA	Processor Representative	GAP	Yes	Yes	Yes
Matthews, Dayna	NMFS, NWR, OLE	Enforcement	EC	Yes	Yes	Yes
Myer, Dale	Arctic Storm	Mothership	GAP/TIQC	Yes	Yes	Yes
Paine, Brent	United Catcher Boats	Trawl Representative	None	Yes	Yes	Yes
Pennisi, John	Monterey	Processor	None	No	Yes	Unk.
Pettinger, Brad	Oregon Trawl Commission	Trawl Vessel Owner	TIQC	Yes	Yes	Yes
Plesha, Joe	Trident Seafoods	Processor—Shoreside Whiting	TIQC	Yes	Unk.	Unk.
Pomeroy, Carrie	California Sea Grant	Tech – Sociologist	None	Yes	Yes	Yes
Quigley, Kate	NMFS, NWR	Tech – Economist	TIQ AT	Yes	Yes	Yes
Radtke, Hans	Consultant	Tech – Economist	SSC	Yes	Yes	Yes
Rankin, Dennis	West Coast Trawl	Trawl Vessel Owner	None	Yes	Unk.	Yes
Roberts, Ian	F/V Good News	Trawl Vessel Owner	None	Yes	Yes	Unk.
Russell, Suzanne	NMFS, NWFSC	Tech – Sociologist	TIQ AT	Yes	Yes	Yes
Saelens, Mark	ODFW, Newport	Tech – Biologist	GMT	Yes	Yes	Yes
Sampson, David	Oregon State University	Tech – Biologist	SSC	Yes	Yes	Yes
Samuels, Jeff	Oregon State Police	Enforcement	EC	Yes	Yes	Yes
Sjostrom, Gary J.	F/V Home Brew	Trawl Vessel Owner	None	No	Yes	Yes
Tillman, Terry	CDFG	Tech – Economist	TIQ AT	Yes	Yes	Yes
Tucker, Glenn		Trawl Vessel Owner	None	No	Yes	Unk.
Waldeck, Dan	Pacific Whiting Conservation Coop.	Catcher-Processor Representative	None	Yes	Yes	Yes
Wrathford, Angela	F/V Mandy J—Eureka	Vessel Owner	None	Yes	Yes	Yes

Table 2. PFMC Staff Attending the Trawl IQ Workshop

Name	Affiliation Yes	Tu.	We.	Th.
Bozzi, Laura	PFMC Staff	Yes	Yes	Yes
Coon, John	PFMC Staff	Yes	Yes	Yes
Dahl, Kit	PFMC Staff	No	Yes	Yes
Heyden, Rene	PFMC Staff	Yes	Yes	Yes
McIsaac, Don	PFMC Staff	Yes	No	No
Seger, Jim	PFMC Staff	Yes	Yes	Yes

Table 3. Consulting Team Members Attending the Trawl IQ Workshop

Name	Affiliation	Tu.	We.	Th.
Hartley, Marcus	NEI	Yes	Yes	Yes
Downs, Mike	EDAW,Inc	Yes	Yes	Yes
Isaacs, Jon	URS, Inc	Yes	Yes	Yes
Lee, Anne	URS, Inc	Yes	Yes	Yes
Marasco, Rich	Consultant	Yes	Yes	Yes
Trumble, Bob	MRAG, Inc	Yes	Yes	Yes
Waters, Ed	Consultant	Yes	Yes	Yes

2.2 Questions on Workshop Agenda

Participants had several questions and comments related to the Workshop agenda. Those questions and comments and, when available, the Project Team's responses, are listed in the following section. Participant questions and comments are indicated with a "P." Project Team responses are indicated with a "T" and are italicized and indented. Project Team Members' names, when available, are provided in parentheses at the beginning of their response. When a discussion continues on a particular comment or question, the participant's reply is also indented.

P: **Community Impacts** are last on last day—is this a reflection of how important it is? How do you see this discussion being a priority? Impacts on communities should be part of every discussion; I'm interested in how you propose doing that analysis.

P: Are we not discussing **Alternatives 2 and 3** at this meeting? I thought we were going to.

P: I'm concerned that if we focus on Alts. 4 and 5 we are diminishing 2 and 3—then we are moving forward with alternatives that haven't been considered enough and it's too late.

2.3 Overview of Alternatives

Marcus Hartley of Northern Economics gave a presentation on the project alternatives. The presentation is included in Appendix A pages 1 – 8.

P: **Alt 4 Question**—Other species—what species are you discussing here that would have OY?

> ***T:*** *Other Species of Groundfish would have OY under Alternative 4—not other species like sharks, skates etc.*

P: **Alt 5—**Gear Sector—when referring gear sectors, are you referring to trawl and fixed gear or are you referring to recreational sector too?

P: **OY**—where is that **threshold level** and what is the motivation for it? Threshold levels would be defined on some level of basic biomass and used for modeling; although this is not currently specified

P: **Trawl Only Options**—what groundfish quota would go to trawl?

> ***T:*** *Council is in the process of determining trawl sector splits; establishment of trawl IFQ program will not set sector allocations*

P: **Historical allocation** is not used in determining allocation under Alt. 5? I assumed Council would look at this as an option rather than becoming part of the program; we must look at historical allocation of permits—needs to be part of analysis

P: Is **cumulative trip limit** the same as annual trip limit?

> ***T:*** *No, it means cumulative trip limit for 2-month trip limits. Assuming 6 trip limits are issued per year.*
>
> **P:** So as part of program alternatives, are you going to look at eliminating the 2-month trip limits and switch to annual limits?
>
> ***T:*** *No, there will still be 2-month trip limits.*

P: **Quota Shares** allocated to trawl? These are reflected in the Programs A-C? Does this include the bycatch species also?

P: Only 1 option is to allocate 100% to harvesters, which is only a sub-option to B. There **should be a stand-alone harvester option** to compare against the others. All options except one allocate shares to processors. How do you fairly analyze the effects of these when they don't appear to be balanced options?

> ***T:*** *These options were developed by the Council and if they need to be changed, the issue must be taken up with the Council.*

P: Program C has an element that held back part of QS for proposals that had both harvesters and processors to help **meet community stability objectives**.

> ***T:*** *Yes, there are options that work toward meeting community stability objectives.*

P: So the way things are structured now, **Option 1 Program B** could never be looked at under Alternative 2 or any other option except under Alternative 3?

> ***T:*** *We would look at what a 90-10% spilt do, etc.*
>
> **P:** But the **Council could pick among different options** among alternatives even if they are only analyzed as part of one alternative?
>
> ***T:*** *(Marcus) yes we are trying to analyze these components separately so that the Council understands their effects.*
>
> ***T:*** *(Jon) Yes—given the complexity of these options, you can simplify the analysis by only analyzing options and sub-options under one alternative but do it in a way that provides the Council with an understanding of the effects so they may mix and match among options and elements if necessary.*

P: Why did you choose **option C** to analyze against all the alternatives?

> ***T:*** *(Marcus) This was the Council's decision to do it this way.*

P: I don't understand what's going on with **processor shares**. Are these shares that would come out of the harvester quotas or would it give processors the right to buy the fish?

> ***T:*** *(Marcus) Shares for processors would be a dedicated access privilege to harvest the fish—not a right to buy fish.*
>
> **P:** Don't we have a limited entry trawl permit? Processors don't have a trawl permit.
>
> ***T:*** *(Jim) This is the heart of the controversy and these options have been taken up by Council and this is where we've come with this issue.*
>
> ***T:*** *(Marcus) Shares that are allocated to processors would have to be harvested on a limited entry vessel.*

P: Are you considering the **shares** that are held by processors (i.e. on processor owned vessels) now into this?

P: **Split between harvesters and processors**—are there caps on how much can be in the processor sector and the harvester sector?

> ***T:*** *(Marcus) There are proposals to have limits on how much any given entity can have.*

P: The only way a harvester is going to have control of what he gets for his product is if he has control of where he sells.

P: Has there been a decision that once these dedicated access privilege are allocated that someone from the environmental community can buy them up. Is there anything in these provisions that tells people how they must be used?

> ***T:*** *(Jim) There are provisions in the Alternatives now is to monitor this issue and if it becomes problem—then address it.*

P: What about **costs to government for enforcing** these alternatives and options?

> ***T:*** *(Rich) We are looking at management costs in 4 components—we are attempting to analyze these programs and their enforcement/management costs so that we can compare that information.*

2.3.1 Goals and Objectives of Workshop

Jon Isaacs (URS, Inc.) gave a presentation and led a discussion on the goals and objectives of the workshop. The presentation can be found in Appendix A, pages 9 – 14. Questions and comments on the goals and objectives of the workshop are presented in the section.

P: Has the Problem Statement already been approved by the Council? P&N?

> ***T:*** *Yes—P&N has already been adopted by the Council and could be subject to change if needed.*

P: If we go forward without looking at **Alternatives 2 and 3,** we will prejudice ourselves against these alternatives for future consideration.

> ***T:*** *(Marcus) The analysis will fully study Alternatives 2 and 3; the intent of the workshop sessions tomorrow is to do a step-wise approach into some of these impacts of the programs so we have a more complete understanding of them. We can address Alternatives 2 and 3 from the analytical perspective, and highlight the primary differences between Alternatives 2 and 3 from Alternative 4.*

P: You are entirely missing the difference in the whiting industry.

> ***T:*** *(Jim) We can incorporate this into the discussion during small group discussions*

P: **Bi-monthly trip limits—**most of the fleet was hoping that would go away with this IFQ program. Could this be incorporated as an option for analysis in the alternatives?

> ***T:*** *(Jon) Are we bound by what Council has developed in the alternatives?*
>
> ***T:*** *(Jim) Analysis must focus on the alternatives proposed by the Council. Alternative 4 does get rid of trip limits. Alternatives 2 and 3 also vary this as sort of hybrids of this management approach. So there is variation for trip limits among the alternatives.*

3 Afternoon Session, Day 1: Presentation of Analyzed Framework

The Marcus Hartley (Northern Economics) provided the Workshop with presentations on the proposed Analytical Framework and on the Affected Stakeholders and Resources. The PowerPoint Presentation on the analytical framework is contained in Appendix A, pages 15 – 48, while the presentation of affected stakeholders and resources is contained in Appendix A, pages 49 - 70. Project team members Rich Marasco, and Bob Trumble also gave brief overviews of biological resources and habitat. Question and comments were taken during the presentations and are summarized below. As in Section 2, above, participant questions and comments are indicated with a "P." Project Team responses are indicated with a "T" and are italicized and indented.

P: When will the Draft EIS (DEIS) be produced?

> ***T:*** *End of the 2nd quarter of 2007.*

P: Why is it one year for Secretarial approval?

> ***T:*** *Once the Council makes the decision, a new DEIS will have to be done, regulations will need to be written and implementation plan must be developed in addition to the review process. All these processes, particularly the regulation-writing process, take a long time.*
>
> **P:** Seems that some of these processes could be done simultaneously.
>
> ***T:*** *(Jon) There are risks associated with overlapping this process and much cannot be done until the ROD is signed.*

P: **Sector Allocations—**2nd Amendment Process isn't reflected in this schedule. These would have to be nailed down.

P: **Communities—**Newport—fishing port of which trawl is a component. Effects in the trawl fishery may have effects on other fisheries. Will the EIS analyze the effects on other fisheries that result from the effects on trawl fisheries? What is the picture? Are we trying to protect existing communities or are we protecting market conditions and future communities?

> ***T:*** *(Mike D.) Under National Std. 8 the analysis must look at what the different alternatives would do to the sustainability of the communities. Engagement vs. dependency—what is the relative importance of this segment of the fishery to the local economy? Part of analysis looks at the overall picture of the community economics. Our job in the analysis is to look at the alternatives that have been developed and provide an analysis of the impacts of those alternatives on the communities in light of existing status quo and future conditions as well.*
>
> **P:** It is important to consider market forces and future conditions in the analysis.
>
> **P:** Some of this should be laid out in terms of the objectives—protection of the communities.

P: Why does **Amendment 18** sunset?

> ***T:*** *If approved by the Secretary—it deals with standardized methodology for dealing with bycatch and non-managed species as well, so Amendment 18 would have provisions that would impact the trawl IFQ program. IFQ program is actually part of the Amendment 18 so the schedule should reflect this.*

P: **Sector Allocations**—If **Secretarial review** goes forward but allocations are not figured out yet, what happens? Also what happens if a new Secretary is put in office in the middle of this process—does the new Secretary have to honor what the previous Secretary had in motion?

> ***T:*** *(Marcus) Is it completely infeasible to have an IFQ system if you don't have hard and fast Sector allocations? That seems to be the general assumption but it seems that you could put something together 'almost'—ranges of OY. Approach could be to issue IFQs in 2 steps—initial IFQs and then the 2nd set.*

P: What are the current operating assumptions?

> ***T:*** *(Jim) Right now Council Staff is working on **intersector** allocation EIS to set these in place. But you could, as part of bi-annual specifications, establish an amount based on that. We may want to refer to the New Zealand sector allocation programs and various options being explored there.*
>
> **P:** So this would be in a holding pattern until allocations happens.
>
> ***T:*** *(Jim) not necessarily; the Council could set allocations to be used in the interim until they are established.*

P: How do you do your analysis without making **assumptions about allocations?** So how are you going to make these assumptions and how are they split out?

> ***T:*** *(Marcus) Assumptions would be based in part on 2005 splits just for analytical purposes. We will be looking at ranges in order to analyze this. We're in the process of rebuilding several stocks and the 2005 numbers don't reflect the best scenario and we would hope that these assumptions would be covered in the analysis.*

P: What is the difference between the **baseline condition and the historical condition** and how will it impact your analysis?

> ***T:*** *(Marcus) The baseline is 2005 data considering historical trends that have occurred and how those trends have impacted the 2005 baseline condition.*
>
> ***T:*** *(Jon) Part of the issue is the challenge in using the most comprehensive data set but in light of the historical trends.*

P: Channel Islands Fishery Management Plan FMP Process—if we had only looked at one year for the baseline for that fishery, you end up with a very skewed representation of the fishery. So instead we used an **average over 20 years** rather than one particular year in order to capture trends. Could this be applied?

> ***T:*** *(Mike D.) This works for some variables but not all—no matter what you choose as your baseline. It is incumbent on the team to capture the trends up to that point.*

P: The amount of fish that's allowed to be caught is based on principles of the stock assessment for that year….all the more reason why you need to average historical data rather than one specific year.

> ***T:*** *(Anne) The difference in analyzing one specific year in light of **historical trends versus using an average number** to do the analysis may not be discernable. In other words, the discussion of impacts will consider historical trends if you were to use an average number or if you used 2005 data in light of historical trends.*

P: Must the NEPA analysis evaluate the **net benefit or net cost** of the potential impacts or just identify them?

> ***T:*** *(Marcus/Jon) Yes, to the extent we can, we must try to evaluate the effect in terms of value or other quantitative measure or significance.*

P: How do you approach estimating **individual effects versus more programmatic effects?** Methodology—how will you approach these questions? Will you use interviews, looking at other programs, etc.?

> ***T:*** *(Marcus) It depends on which action you're looking at, but all of these sources of information will be considered in our analysis. The complexity of this analysis makes it difficult to develop a robust analysis.*

> ***T:*** *(Mike D.) We will be looking at various levels of effects such as community level, individual level, regional level of effects. We will use a tiered approach to evaluating levels of effects.*

P: Council's **Amendment 18** established some catch caps as tools for getting at allocations. Clarity on this issue may be needed?

P: Make sure that ensuring a **steady flow of fish** can work both ways—including when the market doesn't necessarily want it.

P: Even **cumulative trip limits** don't ensure a steady flow of fish in the current system, although it attempts to; make sure this is understood.

P: Cumulative trips limits do **eliminate flexibility.** Fish flow is not that steady either.

P: **Stakeholders—**deficiency of document regarding stakeholders. Can we discuss this today?

> ***T:*** *(Marcus) Yes, this will be part of the presentation.*

P: Might be useful to **interview stock assessment scientists** because they might have some input as far as ups and downs of the stocks.

> ***T:*** *(Marcus) Yes, this has been and will be done.*

> ***T:*** *(Mike D.) Yes this and we also do literature reviews; we also want to take advantage of institutional knowledge of people attending this meeting here today.*

P: Are you looking at market issues in terms of s**ubstitutable species or aquaculture?**

> ***T:*** *(Marcus) Yes we will, especially with regard to the flatfish fishery.*

> ***T:*** *(Jon) We do have to focus on the logical permutations of the alternatives and not anything and everything that could be analyzed.*

P: What about **net revenues?** Is there anything you can use to shed light on this analysis in terms of net revenue?

> ***T:*** *(Marcus) Yes there are cost data; Carl Lian (NMFS) has data that will likely be used in the analysis and anything else that is available.*

P: Is it reasonable to assume that there will be **improved accounting of catch** so that there will be better modeling for the fishery?

> ***T:*** *(Marcus) Yes, we hope that that would be a result of the proposed alternatives.*

P: **Post trade allocation of permits?** Would this be possible to predict and use in the analysis? Allocation will matter and that's my main point.

> ***T:*** *(Marcus) Initial allocation and consolidation across harvesters and processors will be analyzed to the extent that we can. These behavioral changes will really determine the direct and indirect effects of the proposed alternatives.*

P: If QS are only issued to fisherman and not to processors, would effects on processors be indirect or direct?

> ***T:*** *(Marcus) Processors would be directly affected.*

P: **Directly affected stakeholders** are not represented on your slide—such as crew or skippers, owners etc., or are they considered in the harvester group?

> ***T:*** *(Marcus) we are looking at crew members, owners etc. as part of the harvesting sector. Whether they are directly or indirectly affected, they will be looked at in the effects analysis.*

P: Offshore whiting deliver to offshore processors; onshore whiting vessels would be delivering to onshore processors—need to use Council terms **at-sea and shoreside** rather than offshore or onshore.

P: Most people in the industry would think of the **strategy used when fishing rather than the size of their boat** and that's how they would develop categories to analyze, instead of size categories such as Large Diversified Trawl CV or Small Diversified Trawl CV.

P: Is large, small referring to tonnage or length?

> ***T:*** *(Marcus) Length of boats seems to indicate what species they fish for and strategy they use.*
>
> ***T:*** *(Mike D.) The goal of analysis is to capture differences in the fleet, which has to do with relative dependency on the different catch.*

P: **Vessel length is not a good indicator** rather what fisheries they are involved in—themes such as state fisheries, federal fisheries etc. may have more logical breaks.

P: Seems to make a difference to whether you are inshore or offshore; it's an economic thing. So size really doesn't matter.

P: Trawl catcher processors—how will **QS for harvesters versus catcher processors** get allocated?

> ***T:*** *(Jim) QS would be allocated to harvesters and then to processors. It's not a competition between processors and vessels; they are separate allocations. The first step is to split the IFQ into two pieces—the IFQ to be allocated among each group separately. The competition between the two groups happens at the Council level when they initially determine how much percentage is allocated to each group (harvesters/processors).*

P: Indicators for Trawl Harvesters—Why is it operating costs and not capital inputs?

> ***T:*** *(Marcus) We will be looking at capital inputs.*

P: In determining **net revenue**, what data are you using to determine net revenue?

> ***T:*** *(Marcus) Carl Leyan (NMFS) is putting these data together for us.*
>
> **P:** It is critical that this is accurate.
>
> **P:** We do use budgets in our impact modeling but it would be surprising if Carl has anything different than what we are using.
>
> **P:** If you have enough data, you could do a **power analysis** and determine these things rather than using an arbitrary percentage such as 20% but I understand it is difficult to get enough data to do this.

P: **Landings of Bought-Out Permit:** There is another alternative rather than equally dividing landings to boats left, which is to divide it equally among people who are buying it out.

> ***P:*** *Catcher Processors (CPs) are not contributing to buy out so it's those folks that are paying back the loan that would receive shares.*

P: **Classes of Trawl Processors—**I assume you are using the FMP definition of processor?

> ***T:*** *(Marcus) This uses the fish ticket information; processors in the FMP are defined in terms of primary and secondary.*

P: Will you classify processors by fish ticket number or by ownership?

> ***T:*** *(Marcus) Our basic approach is to look at the processing facility; in terms of the allocations, we would need to go through the process of looking at joint ownership etc.*

P: Will you be putting limits in as far as **fish tickets or ownership**?

> ***T:*** *(Marcus) The definition we will be talking about Thursday is the processing facility itself, not, at this point, the buyers. The economic effect takes place where that processing occurs.*

P: **Classification**—will you be distinguishing between **whiting and non-whiting?**

> ***T:*** *(Marcus) We've talked about this and are considering this. There are advantages and disadvantages of doing so.*

P: **Indicators for processors—**the processor tags many fish but none of them get cut there; so if processor gets IQ, he can transfer the fish to another community; that's where the revenue goes?

> ***T:*** *(Marcus) I cannot speak to the why of that question. The allocation would goes to the cutter of the fish; two options—one: take ownership of the fish and you process un-processed groundfish; Two: use definition of FMP—processes un-processed, already processed fish or sells live fish into the market.*

P: **Motherships** will be treated essentially the same although the community effects will be different. Commenter - This is an oversight in your powerpoint. Your **product types** that are listed are very **non-inclusive.**

> ***T:*** *(Marcus) The data we have are limited so our reporting of this is very non-inclusive.*

P: **Communities** - Seattle is missing from the major ports listed in the power point.

P: **Community stability holdback**—where is that being analyzed? Are you going to be doing that?

> ***T:*** *Yes—under Program C, part of Alternatives 2, 3, and 4.*

P: List of communities was just where vessels or processors were stationed; I can imagine communities where trawl fisheries are taking place off shore that may affect the community indirectly even if fish are not processed there. Would you look at these effects?

P: Indirectly Affected Stakeholders—If there is not a lot of reason to break out **recreational harvesters,** we will not be doing so given the difficulty of doing so.

P: When you talk about separating the non-overfished from overfished…could you give me an example, like widow which is currently under a rebuilding plan, and how those types of species would be dealt with?

> ***T:*** *(Rich) They would be dealt with the same as they are now. With respect to overfished species—the analysis will treat them the same as the non-overfished species.*

P: The focus seems to be on habitat, what about non-FMP species? So you would be looking at the whole spectrum of species that might be impacted?

> ***T:*** *(Bob) Yes we would look at the whole spectrum.*

3.1 Day 1 Wrap-Up Session

At the end of Day 1, Jim Seger gave a brief overview of the next day's agenda—the behavioral changes under these proposed Alternatives. Participant comments are recorded below.

P: The Consulting Team appears to have an Alaska mentality where vessels are broken out by shelf or slope—where here it's much smaller, so the break is not so different. The shelf is within 4 miles of the beach—so size of vessel is not really applicable here as it might be in Alaska. Need to totally separate the fallacy of bringing the whiting fleet into the groundfish fleet. Definition of facility processor is based on major amounts of fish; this seems to be a vertical integration of processors where very few control a vast amount of fish. The industry took a big hit as soon as the buy-back program went through. Buy-back power will be lost in this system the way it's set up now. This is a big concern. Need area-specific ITQs to restrict movement.

P: You could plot a 70 to 80-mile radius around a port where a vessel delivers to determine where they fish with a few exceptions. You could construct arcs around ports to determine the likely fishing area.

P: Next species of controversy between harvesters will likely be Shortspine—just as evidenced with the sablefish IFQ program—it was a 'bloodbath' between harvesters.

P: Once the ITQs become sellable—you are going to impact other fisheries.

4 Morning Session, Day 2: Permit Stacking

The second day began with a presentation to the whole group, with a focus and on the No-Action Alternative and on Alternative 5: Permit Stacking. Alternative 5 was chosen as a focus point because it closely resembles the No-Action Alternative, and the Consulting Team felt it was important to address several issues in the context of cumulative trip limits—for example, the relationship between harvesters and processors, and the potential costs of the requirement that 100 percent of catch be observed.

Marcus Hartley provided the PowerPoint presentation which is included in Appendix A, pages 71- 84. Following the large group presentation, participants in the workshop were divided into three small groups for more in-depth discussions. After the small-group sessions, the large group was reconvened and the discussions from each small group were summarized and presented back to large group.

4.1 Questions and Comments during the Large Group Presentation

The participant's questions and comments on the large group presentation are recorded below.

P: How often could the permit be transferred per year?

> ***T:*** *(Jim) Every 2-month period.*

P: There is an emerging market for certified seafood so incentives are created by these programs for changing behavior to increase the value of the catch.

P: Are we to assume that we're managing on a more real-time basis so that there is some consequence or incentive for going over individual caps?

> ***T:*** *(Jim) Yes—some incentive to not exceed caps, but not as much of a need to upgrade monitoring system as in sablefish, for example.*

P: Behavior changes result in leaving the fishery, etc. There needs to be a policy change on the part of Council to address people leaving the fishery for another fishery.

4.2 Permit Stacking Small Breakout Group Summaries

After the presentation to the large group, the participants broke up into three small groups for discussion of particular questions. Each group's Breakout Discussions are summarized in the following sections.

4.2.1 Group 1 Permit Stacking Small Breakout Discussion

What is likely to change with the permit-stacking program?

- Consolidation of the fleet.
    - Yes, this will occur. There are only a set number of permits.
    - Concentration of harvest in a given area.
        - Fewer vessels fishing may result in concentration of fishing effort in certain areas.
        - More difficult to have quality fishing trips because it concentrates effort.
        - Whether this is good or bad is hard to say because it may result in a reduction in incidental catch of certain species in other areas.
        - The better, stronger operators will be the ones left fishing and those that are smaller, weaker will be doing the permit stacking.
        - Latent permits will be the ones bought out first.
        - Rules of stacking—restrictions on permits for stacking certain types of permits. Permits that are not being used at all could be stacked.
        - Issue of latent licenses—how we set up the rules of stacking will make a big difference in driving trip limits down and will dictate by how much.
- If you have a smaller vessel and you have this endorsement, you may be more likely to sell. The amount of overhead in the fishing operation may have greater influence than the amount of revenue.
- Stacking permits and increasing efficiency—limits are going to go down so more people are realizing their entire limits. Total limits will probably go down.

Is permit stacking going to reduce bycatch?

- Bycatch will be reduced—less will be discarded (which may include species that are overfished).
- In the tribal fishery, fewer boats equals a lower bycatch rate. Bycatch is defined by these critical species. So as a result of the permit stacking program, lower bycatch will result.
- Trip limits will be smaller. Permit stacking will likely result in reduction of the base trip limit. There are implications for the cumulative effects of this.
- Ultimately as we maximize the number of permits stacked, the OY/number of permits…
- This assumes that we stay with a stacking of a 2-month period. The trend to switch to longer periods could reduce overhead.

Is it true that some people try to reduce incidental catch and others don't? Why?

- There is cost associated with the time it takes to deal with incidental catch; smaller boats are more likely to not deal with it. So they are more likely to fish cleaner.
- This depends on the boat but generally, smaller boats are making smaller tows, which often have less incidental catch, because they don't want to have to spend the time it takes to deal

with incidental catch. On the other hand, bigger boats can fish deeper which may also be cleaner. So it really just depends. There is a lot of variability with this.

- Is there really any ability to avoid canary rockfish? Yes, to a degree (e.g., bottom trawling), but not every one can avoid them.
- Are there incentives to high-grade with smaller trip limits? Yes.
- There is incentive to retain more and do less high-grading.

Observer Coverage

- What are the implications of 100% Observer coverage?
  - $500 per day is going to cause people to leave the fishery.
- What percentage of the fleet might leave?
- Most trawl vessels can carry an observer.
- Observer costs can be even higher than $500 per day because they can't be taken on or off the boat at will due to weather delays. This is an extremely heavy burden for multi-species groundfish fleets.
- What about using electronic methods to account for catch?
- Cameras can't really tell the number of fish on the deck so using them may not be feasible. Cameras may only indicate whether fish are being discarded and not really provide any information on the amounts of fish.
- Electronic monitoring will result in less time out in the field for enforcement due to the time it will take to have to review tapes.
- Coast Guard Safety Exam—the new observer requirements may result in more people being required to take safety exams and might improve safety.
- Given the cost of the observers, are we obtaining that much more useful information with full monitoring versus the monitoring we do today?
- The Observer Program may allow more biological sampling, which may provide more information on status of stocks.
- Observers up north are used for biological sampling that help in understanding predator-prey relationships etc.
- In this region, there's been a resistance to collect biological information. If this is already collected on shore, the fleet shouldn't have to bear the cost of this. Biological sampling only shoreside may not correctly capture what is being discarded.
- What's the utility of going from 25 to 100% observer coverage? It may allow us to do a power analysis, which is a very a useful tool.
- A compliance monitor is different from a trained observer; there is a difference between hiring a biologist or a technician. The availability of observers also influences this cost. Expenses of observers include airfare, travel expenses, etc.
- What are your alternatives to paying for observers? Don't go fishing. Why should we be responsible for paying for observers, we don't necessarily want them, we want to fish. So why should we have to pay this cost?

- Every case is different; some people have permits for several fisheries, but some do not. Those that only have a few permits would be more likely to not fish. Fuel is triple what it was 5 years ago, profit margins are getting smaller, yet the price of fish is staying the same.
- The cost for observers per day is high because a lot of them are working only 1, 2 or 12 days per month, or maybe not at all. You can't just pay them for the days they work.
- Some fisheries are not conducive to line fisheries, which may reduce the observer costs because you may not need as many observers on deck as with other trawl fisheries.
- Current alternatives are all catch-based programs—not landings based. You can't get around the 100% observer requirement.
- Fixed costs can go down.
- Overall, the observer requirement is going to be a significant problem for many fishermen.

What about the relationship between harvesters and processors with permit stacking?

- You may have to make 2 trips to deliver fish, so you may not make more money because they (processors) may not take more than one delivery.
- Plants may have a smaller number of boats bringing them fish so the volume of what they process may not change as a result of stacking.
- Permit stacking can change where fish are landed.
- Product into the plant—processors would probably want larger deliveries. There may be a benefit of handling the larger flow of product through the plant.
- There is no doubt about the potential for market changes.

What would happen to the price of fish as a result of stacking?

- If the same amount of product is going through the plant, the change shouldn't be there, but it may not work that way. Twice as many fish could mean lower price.
- This one is really an incremental step away from status quo. As we start going to a longer period, deviating from 2-month periods, then we've really begun to mimic a true IFQ program. Why, in other alternatives, is there consideration of allocating shares to fish companies? This seems to be re-allocating.
- Stacking permits may not provide you with more fish. Not everyone fishes the same. There's no benefit to stacking if you can't catch and sell the additional amount of fish.

What about the future behavior of processors with permit stacking?

- They might consolidate too because of larger deliveries.
- Is this different from pressures today? Satellite plants might close because of not being able to deal with larger deliveries.
- There is the likelihood that processing would be more efficient because of economies of scale. The cost of operating over a short span versus a longer span of time.
- Larger deliveries may mean greater efficiency and may not result in lower prices for fish. The quantity of fish is the same but you may get a more efficient scheme.
- Smaller deliveries are not as efficient.

- Larger deliveries would equal better efficiency and therefore higher value.
- Price is a function of demand and supply. Quantities will be the same.
- Will the timing of the supply change? This may be another influence on the price.
- What about product form?
- Yes, in an open-access fishery you end up with whatever product you can put it into as fast as possible. Finished product recoveries increase with rationalization.
- Couldn't reduced trip limits result in efficiencies for both harvesters and processors? This is hard to answer because of timing of deliveries and the size of their deliveries. Processors may dictate when boats can deliver. Companies put the boats on a market limit (whatever they can handle).
- If people have the certainty of regular deliveries, how is this a bad thing—or why doesn't it happen more right now?
- The most valuable fish processed are the last ones processed. You can't cater your capacity to a peak run of 4-5 days, but this is what everyone tries to do.
- Race for fish is gone. So we're just tweaking an existing system with this alternative unless the market changes and we begin developing unique cuts of fish, etc.
- Your 2-month period doesn't result in a mini-race for fish. There are usually fewer landings in the second month than in the first month. This actually seems to be quite variable. Not sure if the data support this.
- There is a possibility of spatial pattern changes.

If you had 150 permits spread up and down the coast—whose permit is going to have more value?

- You are still required to have a license, which have a value, a fixed amount. If you have a permit for a smaller length endorsement, you may have more difficulty financially so you may be more inclined to sell. The market for permits itself has changed because of permit stacking. Vessel length in the south is smaller than in the north and this is not necessarily directly linked to the fishery as much as to geography. Weather is better in the south, so boats are bigger off Washington than Santa Barbara. Length distribution does exist, so if you have this system, smaller permits may take on greater value.
- Market availability further south you go has diminished in recent years and there is no one to sell to. They may make money under this new system because they could sell.

Spatial and Temporal Distribution of Vessels

- Smaller boats are weather constrained but this may not translate into a longitudinal effect but more of a latitudinal effect.
- Oceanographic conditions and market conditions.
- The continental shelf is greater in north so there are more grounds available.

4.2.2 Group 2 Permit Stacking Small Breakout Discussion

Big Picture Questions

- Does stacking apply to a full year or can permits be stacked for fishing periods? More stacking will occur if stacking can be done for each period independently. For example, vessels that fish in Alaska part of the year could stack permits on other vessel while gone. Note: Jim Seger indicated that current regulations allow permit transfers at six-month intervals.
- Will stacking have 100% retention requirement, or allow discarding? Note: the requirement for full catch (rather than landing) reporting could require full retention for video monitoring, but could allow discards if monitored by an observer.
- How would stacking deal with management of overfished species?

Relationship between harvesters and processors

- Importance of continuity?
    - Most vessels have long-term relationships with buying stations/processors.
- Long term relationship/implicit contracts?
    - The relationships between vessels and processors vary considerably, and formal contracts and informal relationships exist among them.
    - Changes in relationships could depend on how stacking changes over time—stacking would likely cause geographic shifts in effort, but boats would tend to maintain existing relationships, or at least use existing relationships as a starting point
    - Effects of latent capacity. If changes in permit stacking can occur often, latent effort will increase, because vessels could take advantage of short-term availability for fishing or could use permits of vessels fishing elsewhere. Transfers of permits only once per year would lead to less use of existing latent capacity.
    - Vessels that stack permits from some other geographic region could strengthen the relationship with their processors, by making more fish available to that processor.

Would the permit stacking system provide any benefits to the whiting fishery?

- Permit stacking would provide little direct benefits to the whiting fishery. However, the availability of overfished species is important to maintaining harvest of target species, and how management develops for the overfished species could have a big impact on the whiting fleet.

How would harvesters change areas in which they fish under a permit stacking program?

- The group agreed that vessels that stack permits will likely stay in the original areas for those vessels. Permits and catch would migrate to the areas of stacking. The group did not determine if particular geographic regions would have a net import or expert of permits.
- The group had a difference of opinion on whether permits would tend to migrate to larger vessels or larger ports. In general, the group agreed with the assumption that permits would travel the path of least resistance, and likely move toward vessels with larger profits.

100% observer/video coverage?

- To understand impacts, we must be able to answer the question "Who pays for the observers or video monitoring, the government or the vessel?" If the government pays, then lower impacts would accrue to the vessel. If vessels pay for observers, then vessels would have to stack permits to generate enough revenue to make the payments.
- Estimating the impacts on vessels of paying for observers requires estimates of actual costs (observer, video) relative to revenues.
- What does the cash flow for multi-species vessels look like relative to cost of observers? Does marginal revenue of stacking add enough to cover costs of observers? If observer costs take up all of revenue generated by stacking, then vessels would have no incentive to stack.
- Small vessels that take 5-6,000 lbs. per day could not afford observers, and would likely have to sell, lease, or otherwise transfer their permits.
- Video monitoring can effectively document whether discarding occurs, but cannot collect biological data. Components of the whiting fleet currently use video monitoring to monitor whether discarding occurs.
- The group expressed concern that the IFQ alternatives and background information did not define how video monitoring would be used and whether the data would have limitations on its use. The group expressed concern that lags in data analysis would lead to difficult enforcement uses.

Stacking over time

- Different effects would occur if vessels can change stacking arrangements every fishing period compared to a single change once each 12-month period
- Multi-period stacking could occur differently in different fisheries –the group predicted that stacking would shift to valuable fisheries, e.g., to sablefish

Could the permit stacking program lead to reduced or increased incidental catches of overfished species? Why or why not?

- The group agreed that bigger limits resulting from stacking would lead to reduced bycatch/discarding
- Larger catch quantities allow vessels to fish more often, stay on the water longer, and vessel operators can learn and stay current with areas of lower bycatch of overfished or undesirable species.

Specialization resulting from permit stacking

- Some vessels that fish in Alaska might stack local permits and forego Alaska pursuits. Staying local would save travel costs. About 20 vessels with high capacity could fall in this group.

Safety

- The group expected little direct change in safety, except that fewer vessels on the ocean mean fewer opportunities for incidents. Vessels that stack permits and remain in the fishery will more likely be profitable, and thereby safer, than vessels that transfer permits.

4.2.3 Group 3 Permit Stacking Small Breakout Discussion

Status Quo/ No Action

- Factors affecting decision to go fishing:
  - How close to the end of cumulative trip limit?
  - Is there an observer on board?
  - Weather
  - Time of year: weather, stock availability and demand conditions
  - What/when the buyer/processor wants to buy
  - Processor schedules deliveries
  - Other fishing opportunities (crab, shrimp, albacore, FG SF, AK)
  - Market price and cost. Seasonal fluctuations in price? (not necessarily) Longer term fluctuations in price driven by demand, world supply and availability of substitutes.
  - Hunting season
  - Not leaving on Friday
  - Availability of crew, ice and supplies
  - Fishing for history (date has been set)

How many permit transfers allowed per year?

- GMT analysis showed fractional trip limits for stacked permits for this reason. Will electronic reporting, total catch accounting mitigate this?

System could be set up to allow higher limits for first/single permits. GMT analysis incorporated this.

- Limit on # permits should be based on ownership, so an owner of multiple vessels can't accumulate too many permits
- This alternative has too many restrictions to be attractive as is. Should include lengthened trip limit period (120 days?)
- Trip limits reduce flexibility for processors.
- Need to neutralize potential effect of latent permits
- Doesn't accomplish goals of IQ program
- PS has been analyzed by GMT(1998-99?)

- Doesn't reduce mgt cost or complexity
- Limits need to be related to fishing history, or some formula (tiers?) Note: This will reduce value of latent permits.
- Stacking will make it harder for new entrants to get in the fishery
- Trip limits per permit would become more restrictive
- Allocative impacts: Number of permits/vessels owned by processors, larger operators should be disclosed. Number of latent permits. These factors will affect outcomes under this alternative.

How would the permit stacking program change relationships between harvesters and processors?

- Reduction in number of vessels increases bargaining power per remaining vessel
- Two month cumulative trip limit imposes artificial market constraints/gluts. Permit stacking may magnify this. Affects market timing and product form.
- Transfers among vessels by owners with multiple vessels would increase deliveries, create gluts
- Single-permit owners would lose out because trip limits per permit would be reduced ("overhead")
- Smaller owners would be closed out by larger operators
- Block of permits could create effects on rest of the fishery, lower the price of product, increase area concentration, close out certain communities. e.g., Canadian experience

Would the permit stacking system provide any benefits to the whiting fishery?

- No benefits to whiting fishery directly
- But would increase opportunity/access to fish for non-whiting groundfish
- When widow recovers enough to be targeted, or allow targeting of yellowtail, stacked trip limits will complicate management of widow trip limits

How would harvesters change the areas in which they fish under a permit stacking program?

- May create incentive to choose low bycatch area/reduce bycatch because 3 times as much will be harvested per trip
- Only affects owners with excess capacity on their vessel

How will processors respond to a permit stacking program? Would they change the timing of their demand for inputs?

- (Not addressed)

What will be the effect having to report 100 percent of the catch, ignoring for the moment the additional cost of the observer/video monitoring program?

- (Not addressed)

Now assume that the combination of video monitoring and observers will cost an average of $500 per day for observers per fishing day. Will it be necessary for harvesters to purchase additional permits to remain viable? How would this change if more emphasis were placed on video monitoring and thereby reducing the costs of the observer/monitoring system?

- (Not addressed)

Could the permit stacking program lead to reduced or increased incidental catches of overfished species? Why or why not?

- Permit stacking would not reduce incidental catch, by itself.

4.3 Questions and Comments on Permit Stacking: Large Group Wrap-Up Session

Following the three breakout sessions, each small group summarized its discussion and presented its findings to the whole workshop.

P: As your trip limits are reduced, you'll retain more fish. As permits are stacked, fewer boats will result in less bycatch.

P: There may be more consolidation towards certain fishing ports but there has already been a lot of consolidation so this program may not cause that much more consolidation.

P: Permit stacking could result in reaching regulatory caps more quickly.

P: How many permits are going to get stacked? What will be the effect on small boats? How many will go out of business?

> ***T:*** *(Marcus) The minimum number of permits would be 57.*

P: Duration of cumulative trip limit period?

> ***T:*** *(Jim) Could go up to a year (more like a quota system).*
>
> **P:** Number of transfers per year?
>
> ***T:*** *One per year. This could be adjusted in the alternative options.*

P: This should be brought to the Council's attention so they can make this modification.

P: Can you lease a permit?

> ***P:*** *Permit just has to be associated with the vessel however that is done as long as it is registered to the vessel. This doesn't really mean that you would be going out of business because permits can be stacked for money.*

P: Latent permits—170 active permits (not all fish). Participation in the fishery—10 years fished is the biggest chunk. Permit holder come in and leave regularly. So in any one year, we should be saying 100—175?

> ***T:*** *We are working through this number and it will be provided in the analysis. This currently does not include the off shore fishery.*

P: I don't see how we've captured a management problem here. Balancing encounters with overfished species…expectation for managing trip limits and encounters with overfished species. If we don't know how behavior is going to change in terms of stacking permits this could be a problem as far as OYs for overfished species.

P: What will permit stacking do as far as reaching caps for overfished species?

P: We're not sure if you're permit stacked whether you would take several days to fish—Processors may not want large volumes of fish but rather smaller deliveries year-round. Several trips versus one trip.

5 Afternoon Session, Day 2: Large Group Presentation of Alternatives 3 and 4

To begin the afternoon session of Day 2, the Marcus Hartley provided a presentation on Alternatives 3 and 4, which is included in Appendix A, pages 85 - 94. There was a brief discussion during the presentation and then the Participants split up into three smaller groups for in-depth discussions.

5.1 Questions and Comments Raised During the Large Group Presentation

P: Under Alternative 3 - Are we to assume overfished species are to be managed under IFQs?

> ***T:*** *Yes.*

P: I am concerned about losing the discussion of the interplay between community stability holdback program and these issues. We need to make sure this is discussed in the EIS.

P: Regarding the idea that processors develop new products—this would fit nicely as part of the intent of the community stability holdback.

> **T:** *Community stability holdback quotas are measured in the number of pounds issued.*

P: Alternative 3 sub-options—whether IFQs would cover overfished species. One sub-option would switch to an OY limit.

> ***T:*** *For this work session, only discuss IFQs for overfished species, not OYs.*

5.2 Alternatives 3 and 4 Small Breakout Discussions

5.2.1 Group 1 Alternatives 3 and 4 Small Breakout Session

5.2.1.1 Issues to be Addressed As Expressed by Participants

- For the EIS—Assumption is that 25% of QS would be given to processors. What sort of discussion will occur in the EIS to support the decision being made? Why are we stopping at the first chain of customers rather than what we might consider secondary customers?
- Processor shares—What is the economic and conservation rationale behind giving processors shares?
    - How will this particular action promote sustainability?
    - What goals are we attempting to be accomplished under this program?
    - Why are we going from no allocation to processors to 25%?
    - How processor shares will hurt the harvesters? Interaction in the marketplace.
    - Different products/product changes
    - Processors have not historically received a share. Why do we have to give them a share now?

5.2.1.2 Breakout Group Discussion

How will the allocations of QS/QP be used by processors? (Assume under this alternative a 75/25% spilt)

- If fish companies control shares—they are likely to make arrangements with certain fisherman to catch those shares.
- Processors may use shares to ensure boats they don't own will fish for them, and as a way of leveraging their access to additional product.
- This question is too big to answer. Processor shares might be the only means of preventing monopolies—they may end up keeping smaller plants alive. They may lease their shares out to others and shut their doors. It may be a good business decision for them to do so. Canada example—after implementing an IFQ system, the three processors that were there were shut down. Shorebased communities may cease to exist unless they have allocations.
- Whiting could move this way under Alternative 4.
- It will likely be difficult for shorebased processors to exist without whiting.
- CPs would likely have the strongest position as a buyer.
- Shorebased processors only have the opportunity to do whiting where CPs may have the ability to move back and forth (to catch Pollock, for example).
- Newer plants may not have the opportunity to start in under this type of program.
- There are differences in opinion about what causes plant closures.
- Under this scenario, an asset is being allocated to a sector (harvesters or processors); unless market forces are controlled, the effects of this are unpredictable unless there are conservation and economic controls to engineer the market.
- As long as there are certain caps on ownership, I don't have an objection to processors owning quota, just the initial allocation of the shares.
- What are the constraints and how should they be implemented rather than trying to predict what the results might be? If this is in place, how should this be structured to protect harvesters, small processors, etc.? How would it protect communities?
- Accumulation caps—do they apply equally across shares? The EIS alternatives will consider accumulation caps.
- Assumptions—are you trying to maintain the existing processor mix and fleet mix? Are you protecting what is status quo or are we moving to more efficiency in certain areas?
- There are trade-offs between efficiency and the social goals of fairness and equity. These need to be clearly laid out in the EIS.

Would the allocation of QS/QP to processors make it more likely that harvesters would try to acquire additional QP? If so, why?

- Depends on what the processors are doing with the other 25% of the shares.
- The less you get, the more you try to acquire.

- This will likely result in a major change. Some are going to have to get greater QS to stay alive and others are going to have to sell to stay alive. People increasing quota and people selling is likely.
- Not everyone will share in the opportunity for processors; people will be acquiring more or selling out.
- Owners of multiple permits/vessels will be in a stronger position than single vessel owners.
- Isn't the point of IFQ to try to reduce capacity?
- Individual accountability (bycatch) seems the primary goal under an IFQ program.

Will processors try to get more?

- Depends on the assumptions for share caps etc.
- Tendency is yes. New Zealand example—accumulation caps are critical. Harvesters there are not happy with the results of the IFQ program.

How would alternative allocation percentages affect harvesters and processors?

- Changing percentages will change the intensity of the behavioral changes.
- This is a huge equity issue—same amount of fish gets landed but fewer people have the opportunity to share in the quota. The problem of equity is exacerbated. This program may have possible cumulative effects with other initial conditions such as trawl buy back. Processor quota would likely reduce opportunity to realize the benefits associated with the buyback.

Is it likely that processors would change the products they produce under an IFQ program? What changes might you make?

- Product form is likely to change radically, particularly in the whiting fishery. Shorebased whiting industry now does one or two products exclusively. Just as under the AFA, there was diversification in product form. You may see additional products that were never produced before. What leads to this? In a rationalized system it's not the timing, it's what you can do with the fixed quantity that you have.
- Would new product forms be more profitable? Goal is what you could do to enhance your product. This is a likely change in all species under this type of system.
- Whiting open access moving toward IFQ may mean more of the product being produced.
- Do you see these results and changes as a result in the IFQ system or is it a result of these certain assumptions of 75/25%
- In general, slowing the fishery down will mean production of more of the product and more types of products.
- Non-whiting sector allocation of 25% of QS to processors will make it difficult for new young startup companies to enter, thus possibly discouraging development of new products.
- Option for gear flexibility? Would different types of product result in different gear types?

- Opportunity to use other gears is limited. Gear types are relatively constrained due to bycatch.
- It would be nice to have the option to use other gear types and should be encouraged if it's a cleaner way to fish; more flexibility would be helpful. You may get better prices by using other gear (e.g. pot for black cod).

Is it likely that processors would change the timing of their purchase demands for particular species in an effort to reduce incidental catch and thereby increase target catches?

- Don't foresee this changing. Timing will shift considerably to better fit fishing in certain areas and to deal with bycatch issues. This is more a function of the flexibility of the relationship then to the availability of fish.

Whiting seasons would be eliminated under Alternative 3. What would the effect of this be?

- Speculation about the nature of the stocks.
- There might be an opportunity to develop a roe market in Japan, China etc.
- Reduction in salmon bycatch and other groundfish species is a major issue in this fishery. Stretching out the season does help address this problem to a certain extent.

Would you expect whiting vessels that don't currently fish for other types of groundfish to change behavior with respect to timing or areas fished to reduce incidental bycatch?

- Being able to time this is a big deal for bycatch. It is nice to have the option.

How would harvesters change timing or areas of fishing under this simplified IFQ compared to permit stacking?

- Seems like market forces influence catch—when you go after catch.
- With an IFQ program, you have the chance to adjust your timing.
- If period became 12 months rather than 2 months, you have more flexibility to avoid bycatch.

With regard to the extra cost of the observer program; Is it likely that harvesters would need to purchase additional QS/QP to cover those additional costs?

- Accumulating shares can be a huge cost. Accumulating shares is not easy but costly.
- Will willingness to pay for additional QS diminish because of cost of having to pay for observer program?
- Getting more QS does not always mean you'll be more profitable, especially initially.
- Weighing various costs—putting constraints on who can own shares.
- Is 100% observer coverage mandatory for this or is 100% monitoring? The idea is to enforce the individual accountability, not necessarily to collect more data.

- A platoon fishing season could reduce the potential cost of observers. Would fishers be open to this? This eliminates the flexibility of fishing (a goal of the IFQ program).
- Cost for observers is spread out over greater amount of time under an IFQ so it may be more costly. How hard your observer costs hits you is directly related to the value of the fish in your hold on those days at sea that you are required to have observers.
- Observer program means more data collection and seems like a service to the government.

How would this change if the emphasis were on video monitoring thereby reducing the costs of the observing program? Is video monitoring a viable alternative?

- There is cost and time associated with viewing tapes. How are you trying to use this information? Would the fear of having video monitoring be enough to encourage cleaner fishing? Are the images good enough to see what's going on?

How do you think the elimination of whiting sectors will affect the distribution of whiting between whiting processing sectors?

- Shorebased processors and motherships would cease to exist.
- CPs are more efficient and would continue to operate.
- If there isn't enough capacity of CPs to deal with the larger amount of fish, shorebased and motherships may continue, but may not for long. This is likely to be short term.
- Communities with shorebased processors would be affected.

5.2.2 Group 2 Alternatives 3 and 4 Small Breakout Session

How will QS be used by processors?

- Will processors give/lease to affiliated harvesters or acquire own fleet?
- Over time, fishermen and processors would work out long-term arrangements—they would need to come to mutual agreement on the use of the processor QS. Business plans of the processors would affect their decision to keep, lease, sell, or give away access to the shares.
- Processors bringing in third party vessels from outside the area to harvest processor held shares would de-stabilize the fishery (contrary to goals of program)
- A 25% loss of shares from harvesters to the processors would eliminate harvesters' profit margin, and they would have to work out a way to recapture that profit under the new system. Harvester access to processor held shares may be a question of how much harvesters are willing to pay for use of processor held shares.
- However used, processor held QS would change the way of bargaining—as would the IFQ program itself. Harvester and processors both have concerns that the other sector could unreasonably drive the price of fish to their detriment—through a "take it or leave it" stance.
- Processor ownership of shares would perhaps accelerate the consolidation of the processing sector that is already taking place, with a limited number of companies gaining larger market share.

Will harvesters try and acquire more QS?

- Yes; acquiring more QS is a natural impact of an IQ system through consolidation over time as seen in other places where IFQs have been implemented. (Previous experience has demonstrated consolidation within harvester sectors; no experience exists with a program that initially allocates harvester shares to processors.)

Will processors try and acquire more QS?

- Yes; the group reached a consensus that processors would acquire more harvester share over time, altering the original allocative split percentage.

Would a 90/10 allocation make a difference?

- The initial allocation would have no long term difference, but would cause a different starting point that could have very different short term impacts. The starting point would likely have an impact on the pace of change, with higher proportions assigned to processors leading to faster changes.

Is it likely that processors would change products under IFQ program? What kinds of changes?

- The flexibility resulting from an IFQ program would allow more of a shift toward filling market needs.
- With an opportunity to fish at a slower pace and in sync with the market, processors could develop new product forms. Whether new products develop, IFQ will drive overall improvement in recovery rates and quality.
- There will be some development of specialty products.
- Processors will have a new opportunity to look at value-added products.
- The whiting C/P fleet has moved to products other than surimi; the rationalization resulting from formation of a co-op has provided this fleet with more opportunity to explore other products.
- In general, analysts need to be careful about attributing causality of product shifts to the IFQ system when the market is already driving product form changes; e.g., some of the C/P product changes were market driven as surimi demand decreased.
- In general, IFQ system will allow for better strategic decision-making and predictability.

Whiting fishery changes—whiting seasons would be eliminated—would whiting vessels change their behavior (timing, areas fished) to reduce bycatch?

- Most participants in the group believed that the whiting fishery would still be driven by seasonal availability. While harvesters and processors may make some seasonal changes, the changes would probably not be major.
- Whiting harvesters would have an opportunity to fish during the periods of low bycatch (Fall) if the change made business sense. However, a regulatory change in the seasons would have to go through Section 7 consultation to examine the impacts of the change on bycatch.

How would harvesters change timing or areas of fishing under this simplified IFQ compared to permit stacking? (Toward where CPUE/incidental catch balance is favorable?)

- The group could not reach consensus on this issue. Some said that processors would want a steady flow of product during the year, while others provided information that processors would want to work around other, more time-constrained fisheries.

What will be the effect of the IFQ program on incidental catches of overfished species?

- Harvesters will have an incentive to save catch of overfished species to the end of the fishing year as a requirement for harvesting desirable target species. This incentive would occur regardless of the form of management of the overfished species.
- Harvesters need a mechanism to save overfished species to the end of the year, or they may lose the opportunity to catch their full allotments of target species.
- Eliminating the race for fish would allow for a slower fishery. Harvesters could take steps to lower bycatch without the competitive disadvantage that would have occurred in open access.
- IFQs would reduce the current amount of discards (of target and overfished species), and make more fish available for retention.

Would observer/monitoring program costs drive QS/QP purchases following initial allocation?

- Fishing could occur over more consecutive days than under permit stacking. If harvesters could have observers on board for longer periods, lower overhead would decrease overall observer costs compared to permit stacking.
- Participants noted that observer coverage would depend on the goals and objectives of the observer program; as data needs increase, observer coverage could also increase (e.g., Community Development Quota vessels in AK have two observers on each vessel to increase accuracy to manage individual species quotas).
- Participants noted that whiting motherships and C/P currently pay for their own observers.
- GF vessels with low QS could have problems paying for observers, which would make them more likely to sell, lease, or otherwise transfer the QS. Vessels with larger QS might need to buy QS to pay for observers.

Under Alternative 4, how would eliminating whiting sectors affect distribution of whiting between whiting processing sectors?

- Motherships and shoreside could lose shares.

Alternative 2 has 4 sectors (shoreside non-whiting, shoreside whiting, CPs, MS)

- If the IQ program has QS or other individual allotment of overfished species, separate allocation of the overfished species would be needed to avoid one shoreside sector shutting down the other.

Alternative 3 has 3 sectors (combined shoreside, CPs, MS)

Community stability hold-back (non-whiting component)

- The hold-back would likely create more management expense, either at the expense of the community or the participating QS holder.
- Even though the hold-back would go to QS holder(s), redistribution of the QP may cause instability in the fleet. The administrator of the hold-back is not identified, and could have a substantial impact in determining whether the instability occurs.
- Most of vessels and processors are currently part of the communities, so what benefits them does benefit the communities.
- Hold-backs could end up pitting one community against another, for example by a buying station or processing facility threatening to leave one community for another unless the community offers a subsidy.
- The impacts of hold-backs have to be considered in the context of changes currently taking place without an IQ program. Consolidation and specialization will happen anyway, as demonstrated by the loss of working waterfronts along the coast. Group members considered that the effects of IFQs on communities will vary more or less depending on characteristics of the communities.
- Have poor data for catch history for processors and communities, but processors and communities can release if want.

Group members pointed out two central concerns related to the effects of IFQs:

- Group members expressed concern about whether the IQ system has caps on ownership. They recommended evaluation of “use it or lose it” provisions so that IFQ could not be bought and shelved by entities that want to reduce the amount of fishing.
- Group members noted that if the IQ program establishes QS or other individual allotments for overfished species, then those QS become the currency for the full fishery. Group members expressed concern for QS for overfished species issued to those who caught the most such that they get the most of the overfished species. QS based on history works against those who avoided overfished species. Any entity that accrued too much QS of overfished species could control the entire fishery.
    - As an alternative, the group recommended consideration of individual bycatch account system or bycatch co-op systems to control distribution and use of overfished species.
    - As an alternative, the group recommended consideration of allocating overfished species in proportion to QS of other target species.

5.2.3 Group 3 Alternatives 3 and 4 Small Breakout Session

How will Processors use their allocations of QS/QP? Give to harvesters? Lease to harvesters? Use with own vessels and use profits to expand fleet?

- Processor QS is of little value to processors, except to negotiate with harvesters to get deliveries, or else could be fished on a processor's vessel.
- On "day 2", sales, purchases and consolidation of QS will have changed the game. Very many possibilities.
- Relationship between processors and harvesters is already very complex, interlinked with other fisheries. Processor QS is another layer of proc control.
- Under the Status Quo there are fewer options, so incentives are less important. With IQ program, options are expanded and changed, so incentives are necessary to maintain flow of product.
- QS represents access to the ocean.
- It is not necessarily a win-win among processors for processors to get QS.
- Processor QS will make it more difficult for new entrants: harvesters and processors.
- Do shoreside processors have responsibility to pay for observers?
- Should examine experience of BC groundfish and East Coast surfclam fisheries.

Would harvesters be more likely to acquire IQ?

- Yes. If they start at 75% they need to acquire more just to stay whole.
- Yes just because it makes good business sense.

Would harvesters be more likely to sell IQ?

- Yes
- (Note: 26 permits are being targeted for purchase by Nature Conservancy)
- QS for overfished species increases likelihood that somebody can corner the market, for whatever purpose.

What about other processor allocations? 10%, 50%

- More of the same…

Will Processors change the products produced?

- Yes. Less freeze, more fresh. Currently do freeze, but not by choice. The market in British Columbia is very responsive to demand.
- Eliminating artificial trip limit deadlines will improve product flow.
- Product recovery rates increase

Will Harvesters change products delivered?

- Maybe.
- Opportunities for harvesters and processors to bargain as co-equals and investigate new options.
- More revenue sharing?

Will Procs adjust timing of deliveries of certain spp to reduce bycatch and increase amounts of target spp?

- Uncertain, because too many other factors involved (markets, price)

What data are available with respect to products and prices?

- This group did not address this issue

What is effect on whiting fishery of eliminating sector-specific seasons?

- Current seasons were designed at least partly to reduce salmon bycatch.
- There is competition to be first with product. This can drive bycatch, but there will no longer be a race for fish.
- There is competition between processors for a limited pool of harvesters.

How would whiting (and non-whiting) harvesters change behavior (timing or areas fished) to reduce bycatch? What will be effect on overfished species?

- There may be a race for fish to avoid being shut down because of somebody else.
- Co-ops may be formed to pool bycatch quota: e.g., hotspot tracking
- How to prevent opportunistic price gauging for QS for the most limiting spp
- Enforcement Consultants recommendation: Must have 1 QP of each species before leaving the dock
- Would need to know when a “sector” is approaching exhaustion of available QP
- Many potential problems with QS for overfished spp
- Incentive to hold canary QS and sell dearly to those in need

Would non-whiting harvesters change behavior (timing or areas fished) to reduce bycatch?

- (see above)

Will harvesters need to buy additional QS/QP in order to afford observer costs @ $500 per day?

- (Note: At-sea MS costs $350 per observer per day, but more days at sea)
- If can't afford $500 per day then would likely sell QS
- Small boat averages $1,500 per day.
- Assuming $350/day and 100 days per year, would need to average at least $75,000 more ex-vessel per year to cover observers and other additional costs.
- 20% coverage is "status quo". What is a minimum coverage level to be "acceptable"

What about video monitoring?

- (not addressed)

Under Alt 4, whiting seasons and sectors are eliminated. How will this affect the distribution of whiting between processing sectors?

- CPs are most efficient, highly mobile so they will overrun the whiting fishery.
- Note: Alternative 2 has 4 sectors (shoreside non-whiting, shoreside whiting, CPs, MS), Alt 3 has 3 sectors (combined shoreside, CPs, MS)

Community Stability Holdback Program: up to 25% of QP will be held back and made available competitively for quota holder ventures based on criteria to be specified.

- May be better associated with a different Harvester-Processor split than Program C (25-75)
- Does this include shoreside QPs only. Yes, shoreside, non-whiting only.
- Review panel with quantitative criteria would need to decide which proposals get QPs. Subdivisions by state?
- Would need to have a processor to qualify as a "community"?
- Ports that currently have trawlers and processing should be eligible
- Are there other ways to mitigate impacts than this type of program?
- Some commercial fishery dependent communities will die without a commercial fishery. This program may keep options open for these communities, and save infrastructure.
- Impact on efficiency should be investigated: dispersion of capital?
- Neither Processor QS nor Harvester QS will stay in a particular community
- Zero sum game…

5.3 Alternatives 3 and 4: Large Group Wrap-Up

P: Discussion on cost per day for observers—boats under 60 ft. split equally with boats over 60ft. in having to pay costs for the observer program.

P: What is the true goal of the observer program? It doesn't necessarily have to be 100% to accomplish some goals.

6 Session 1, Day 3: Large Group Discussion on Allocations to Processors

Day 3 began with Marcus providing a PowerPoint presentation on allocations to processors (Appendix A, pages 95 – 104). The presentation summarized problems in the current definitions of processors with respect to allocations of IFQs and proposed a solution. During the presentation, comments and questions were accepted and discussed. That discussion is summarized in the following section.

P: Who pays the landing taxes?

> ***T:*** *Tax would be paid if you're a purchaser—you'd pay a state revenue tax which solves part of the issue related to receiving products.*

P: A fish ticket does indicate whether it comes in on the round or whether something has been done to it.

P: There are no permits for motherships.

P: Under a trawl IFQ program—don't you only need to identify those plants that purchase trawl caught groundfish?

> ***T:*** *(Marcus) But we don't know from the fish ticket data whether it was delivered live fish. Discussion of delivery of live fish; whether it occurs or not.*

> ***T:*** *(Jim) Not just identifying who the processor is but the issue is if you're allocating based on history which is difficult to gather from fish ticket information. There may be governmental records of some kind but the issue is whether they are in a central repository and whether they could be put there.*

P: With the advent of paying for the buy back—everyone that has landed a live fish; wouldn't there be a record there of this?

P: Clarify point that recording groundfish tickets—only concerned with trawl caught fish.

P: Under this system, could you end up with unprocessed fish that would not go to anyone?

> **T:** Fish don't go away if QS is not award—everyone gets more this way. There may be processors out there who may not apply for QS. It is not NMFS responsibility to seek those people.

P: Consultant definition of on-shore processor—last bullet—the fish ticket is filled out by people that do that. So how does the data set tell you who actually processes?

P: The majority of the species groups who go through the record channels—it's easy to find out who processes, but down in California this becomes much more complicated because of all the different smaller groups. You should focus on the main species that we're fishing for and then the other small groups of other species; by aiming at bigger groups, you won't get lost in this definition.

P: Fundamental question of why QS would be allocated to processors from fisherman customers—this rationale was not addressed in any of the options. Will the EIS describe the basis and philosophy of why this is to occur?

> ***T:*** *(Marcus) To the extent that this is laid out in the Purpose and Need, the better it is. In the future proposed rule, there will likely be a statement that would explain the rationale behind NMFS' decision to allocate to processors.*

P: But the decision-makers will need this rationale in front of them when making the decision about the alternative. When will the rationale be specified?

> ***T:*** *(Jim) This will be presented in the document and will be brought to the forefront.*

P: Agree that this is a policy/political question that the Council staff needs to address. If you are going to do an analysis of this rationale that you analyze allocations to all groups (holistic analysis), not just of allocations to processors.

P: If Council were to set an objective of what their going to do, the Council needs to be aware of the potential consequences of their decision. Regarding allocations to processors, policymakers would need to know the effects of this early on in the decision-making process. Until the Council understands some of the potential impacts of this, how can they define their objective? Analysts should make policymakers aware of the consequences of this decision before making the decision to do this. The question of whether or not to provide preliminary analysis of the potential effects of processor shares and provide this information to the Council before they determine the reasonable range of alternatives or whether to wait and provide this information to the Council as part of the analysis in the EIS should be considered now.

P: Allocations of QS: I don't understand why they are being split up. Why the QS would be distributed? QS belong to the harvesters. Now you're taking our QS away from us. I understand the fleet should be consolidated, but it doesn't make sense to give QS to processors. You want to push this under the table and we're not even taking about it and it's a major issue. Such a big emphasis on processor shares instead of managing the stocks.

> ***T:*** *(Jim) We have a range of options we're looking at, including allocations to processors and not allocating to processors etc. We are obligated to evaluate a range of reasonable alternatives and how the achieve goals and objectives and their associated impacts. When the Council makes their decision on this issue, they will review all of these analyses. Make sure that the things you agree with are on the table so they can be evaluated as part of this decision so the Council members are better informed. The EIS must evaluate these issues and be informative about the potential impacts.*

P: Part of our charge under NEPA is to evaluate all of these economic issues that not only affect on processors, but also on skippers, crews, and others employed in the fishery.

P: There are two components to this issue—analytical component of the economic changes resulting from allocations and then there is the value judgment of who gets the money.

7 Session 2, Day 3: Community Impacts Discussion

Session 2 on Day 3 focused on a discussion of Community Impacts. Mike Downs (EDAW, Inc.) provided a PowerPoint presentation (included in Appendix A on pages 105 - 120) and led a large-group discussion. Several different subtopics were discussed, with each subtopic introducing specific questions for discussion. These questions and their discussions are summarized in the following sections.

7.1 The Nature, Direction, and Magnitude of Impacts

The following questions were put to the Participants for discussion in this session:

1. In general, how would fishery management changes under the proposed IFQ or permit stacking programs result in impacts to communities?
2. How would impacts be distributed among communities? (Who would likely gain/lose)
3. What would cause community impacts? (Fleet or processing consolidation? Change in timing or location of landings?)
4. How would the impact be felt? (What would happen?)
5. How would impacts differ in communities that are home to catcher vessels versus communities that are home to processors?
6. Where are fishery support businesses located and how would they be affected?
7. How substantial would community impacts be and what communities would be most vulnerable?

P: Communities that are not trawl communities (e.g., Port Orford) would be impacted as well by these changes. Many communities feel the impacts of serial depletion of certain species without controls. What do we need to do to get our community included in this analysis?

P: Serial depletion and potential fragmentation—point made for the management of fish on a coast-wide basis, regional management of fisheries. The analysis should contrast the regional management and status quo and the way it is currently split out.

P: Any rationalization scheme has significant impacts. Unalaska, Alaska example post consolidation of the crab fishery; this consolidation has resulted in a slow-down in the support service industry and in people leaving the community. A similar result is likely under this scenario for the west coast.

P: It's important for each of the fishery dependent communities—are you going to analyze what that community feels their ideal needs are? What does the fishery want to see as far as options in their community—ideal fleet size and what is needed to support it. Some areas may have fewer/more boats due to the recent buyback; community quota could be very useful. The trawl fishery IFQ committee had a provision to allow other gear types under an IFQ—could they be used for other gears if they see the need to do so? Communities could acquire IFQs themselves to establish stability and then be able to lease it out. There may be opportunity for communities to take more control through these mechanisms.

P: Has the Council made it clear with regard to area management? Is that going to be folded into the IFQ system?

> ***T:*** *Provisions have been put in place for creation of area management after the initial IFQ (e.g., if the Council decides to split OY, etc.) So redevelopment of allocation process would not have to be done. This would have to be taken into account when Council makes final decision.*

P: How are you planning on gathering community data?

> ***T:*** *Background info will come from ongoing efforts, community profiles, dependence and vulnerability assessment, etc. NWFSC Community Profile project currently going out for review. Available on the website. Short term profiles—baseline info describing dependence on fisheries, how important fisheries are to the communities. Another project—dependency resiliency indicators are being developed—in terms of ways to rank communities based on these indicators to compare communities to each other to understand the importance of fishing to these communities. June briefing on this issue in Council forthcoming.*

P: Long-term impacts to communities—artificial restraints on the market opportunities are not beneficial. IFQ holder / processor team effort to look at new opportunities. Do not want to see restraints on this.

P: During down times—communities are more vulnerable to long term or permanent changes away from the fishing industry (e.g. processing facilities becoming hotels etc.) and there is a permanent loss of working waterfront. There may be unintended consequences with this program as far as losing more of that waterfront infrastructure that could be detrimental to the fishery as a whole.

P: Some communities are not highly visible as far as their dependence on the fishery resulting in the need to travel from these less visible communities to get access, which could take away from other communities. This needs to be part of the analysis (e.g., Neah Bay).

P: A buying station can come and go. Don't see the benefit of giving them harvester shares as part of the allocation to processors.

P: Don't see other industries having to give away 25% of their business. Don't agree with giving processors shares. This adds more constraint. If share gets taken away from the harvesters, it's going to cut back the harvester effort. Regardless of the percentage, it's additional constraint on free market. This has an effect on mobility.

P: Would the Council want to build in an option—for the benefit of communities, would we want to put a constraint on this flow?

P: Constraint was never part of this. Ultimate benefit is that money would come back to the port. No one should be told where they have to land.

P: IFQ program—would affect each sector of whiting separately. Some may be affected, some may not. Mothership sector—has been acting as a rationalized sector but this could change. Don't see a lot of change for processors, may not be much consolidation.

P: Catcher vessels (mothership sector—expansion of vessels and participants to vessels that receive quota and them major consolidation after this. Shoreside sector—most affected. Increase in capacity of harvesting sector—there would have to be some consolidation depending on who receives QS. Whatever system is chosen, consolidation will result. Timing—Don't see an IFQ program affecting timing for catcher-processors or motherships. Shoreside may take fish at a different time but this may be beneficial.

P: Changes will be different by sector and community—mothership sector and CVs—Seattle and Newport—don't see consolidation in these sectors. Likely consolidation in vessels in these areas; crossing between sectors likely. There will likely be consolidation among vessels but not a lot of movement between communities.

P: Shoreside communities are more spread out. Astoria, Westport and Newport.

P: Impacts of IFQ system could result in shore-based processors leaving entirely—Canada example—leaving for other countries because there was no market left after implementation of the IFQ. Off-shore joint venture—fisherman pooled collected quota and built off-shore facilities. Major impact on the coastal communities.

P: Alternative that removes sector splits for whiting—this will result in community impact from processing moving offshore. This will result in a major impact.

P: Potential Data Source—what the fishery means to coastal communities.

P: A processor company has recently done an analysis of their economic impact on their community. This can be provided to you as a template to use for the analysis.

P: Important to analyze the effects of the buyback program on the communities. The buyback program resulted in geographically disproportionate impacts—which we can learn from.

P: Need an analysis of quality of employment. Example, some plants have benefits, 401K, process sharing, unions. When you have various allocation scenarios, consolidation in the fleet resulting in market changes, how will this affect the quality of these jobs?

P: What will consolidation mean for the ability of processors to continue to assume market risks (e.g., custom processing, fee-base processing, etc)? What does this change do to employment in processing and supporting businesses as well?

P: Example of what's happening in crab market. Canada—Opilio market—custom processing market arrangement. Any costs above their processing costs went back to the fleet. Depressed the value of the crab stocks worldwide due to lack of incentive for processors to do anything with the product.

P: Under Program C (75/25%), immediate reaction—how does this compare to other alternatives and status quo. This has not been clearly laid out by Council in terms of what needs to be prepared. Status quo—community profiles being developed; propose to look at community impacts, permit stack, 100% harvest, and high or low processor share. This makes a big difference in terms of the effects. Generically—three options for communities (listed in presentation) need to be evaluated as well. Isn't really a need for a holdback in the communities but the analysis can help show this.

P: Make sure the final analysis includes these issues and presents the outcome.

P: Analysis should evaluate recent consolidation of processing on the coast, what has already taken place as a result of the buyback. Tough to define what the community is. (Little money spent in some smaller communities—rather it's going to larger communities) Need to look at where money is being spent. Profits distributed by crew, vendors, etc. Strictly trawl communities—not very many—impacts have occurred for years. Could be a measure of future impact of status quo. Have varied over years and may not be that different in the future.

P: Neah Bay—Important to recognize as tribal and non-tribal community. Facility and support services available for the non-tribal fleet. Maintained facilities and services that are open for non-tribal fleet, we welcome their business in the community. Currently there is a buying station. Whiting business focus. Looking to expand opportunities in Neah Bay to restore processing and fleet support services. How would consolidation under IFQ work—it may not meet biological objectives, accountability. Could lead to consolidation without safeguards or limitations. Could force smaller vessels out of business. Tribe does not want to see this impact. Fleet has been shrinking over the years. Consolidation could stifle development or redevelopment of processing and fleet support activities. There are communities that only have fishing—it is their only sustainable opportunity. Tribe looking to redeveloping infrastructure in the future and would like the IFQ program to help this, not make it more difficult.

7.2 Community Aggregation for Analysis

The following question was asked of participants

1. What communities should be lumped together for analysis? (Why, what are the common ties?)

P: Landings data along the coast to explore different definitions of community. What are the patterns up and down the coast in terms of this activity? This is another type of analysis ongoing that may be useful. Cindy Thomson—NMFS Santa Cruz is studying landings and permit data—provides info on where people live but may not provide info on where they are spending money on the fishery. Landings patterns may provide more information on the activities. Important to understand that people may be based in one location but their contribution to the fishery may be somewhere else and this needs to be analyzed in the EIS as far as the impacts to communities. Impacts of an IFQ program—especially noted in Moss Landing, maybe in Monterrey but may not in other areas.

P: Analysis—1999-2003—Moss Landing—socioeconomic impacts of the regulations—did analyze all fisheries and the impacts which could provide a snapshot before the buyback program.

P: Map in presentation—Edmonds, WA should be lumped with Seattle.

P: Ports in Oregon—Grouings—Astoria, Seaside, Garibaldi, Warrenton, Newport, South Beach (Toledo), Coos Bay, North Bend, Bandon, Brookings.

P: Port Orford does not want to be lumped with any other community. Is this for needs of the analysis; why lump?

T: When communities are small enough, they must be aggregated with other communities.

P: Is there a way around confidentiality problem? If a community wants to be stand alone in the analysis, could they be required to provide data?

7.3 Environmental Justice Issues

The following questions were asked of the large group.

1. Are there minority populations of concern?
2. Are there low-income populations of concern?

P: Project—interviewed Asian immigrants and their engagement in fishery regulations. They may be a population of concern. Study will be sent to consultant team.

7.4 Community Stability Holdback Option Analysis

1. Likely outcomes of holdback program?
2. Allocation criteria input
   a. Past performance
   b. Utilization
   c. Local added value
   d. Local labor employment
   e. Local labor earnings
   f. Public debt
   g. Public investment
   h. Port dependence
   i. Other (from public input)

P: Community holdback program—Incur new costs of getting extra product.

P: Community programs—processors that do not have facilities—shifts in processors by regions would compete in different markets—needs to be analyzed.

P: Aberdeen is in there—West Port needs to be included—large landings should be noted.

P: Port Townsend—Why is it on the list?

T: *The data in the map represent data on the community of residence of permit holders.*

P: Blaine, WA—not on map?

P: Consolidation may result in increase in property value due to businesses shifting to other things (hotels resorts, etc).

P: Modification of community holdback option—is there a regional option that would devolve that decision making to smaller pieces? This would have to be brought to Council to be addressed.

P: Community holdback—analyze what this could do to marketers obtaining a mass of products to entice buyers. Could create obstacles to obtain critical mass of product thereby resulting in artificial constraints to be able to market.

P: There is a flip side to this—you would have to create incentives for holdback too. There could be a commitment required of buyers to buy the held back pounds.

P: Community concern over losing fishing effort. There is a Corps of Engineers requirement to have a minimum number of vessels in a harbor to justify dredging harbors.

P: Processing plants are where they are due to fishing; where the fish are. What's good for fishermen is good for communities.

P: Community holdback—have you looked at safeguards? Many community budgets do not support administrative responsibilities that may come with ownership of shares.

> ***T:*** *The options allow communities to purchase QS if they want to. Safeguards on these would be whatever the local community safeguards are in place.*

P: Fishing community property shifts to other types of businesses. In the northeast of the U.S., there is a plan to do something to address over-development of hotels etc. buying up fishing industry infrastructure.

P: Clarify the Hold-back—does unclaimed quota goes back into the sector? QS/QP issued each year—allocated back to the holders of QS/QP to use those shares in ways to benefit communities. How would this play out in isolated areas where processors have left (CA). If the communities have a history of processing, do they have access to shares?

P: If there isn't a recent participation requirement, seems like if a processor has left but there is a history of processing, why not use this as an endowment for the community?

P: Is it intended that the whiting allocations for communities would come off the top or off the top by sector? Understanding is that this is not the intent. This program only applies to the shoreside portion.

8 Session 3, Day 3: Consolidation

Marcus Hartley provided the workshop with a PowerPoint presentation on the subject of consolidation and how consolidation is likely to be addressed in the EIS. The presentation is included in Appendix A, pages 121 - 129. Questions and comments were taken and discussed during the presentation and these are summarized below.

P: Fish that are overfished now will be rebuilt in the future—so how would you change your analysis to deal with species whose status might change in the future?

P: Was there consideration to deal with the allocation based on revenues paid rather than catch history?

> ***T***: *Problems associated with accuracy of data collected on ex-vessel revenues paid. Revenues paid is not being considered now as a allocation method.*
>
> ***T***: *Design elements for analysis—looking for sufficient analysis to determine whether it needs to be put back into the alternative elements and fully analyzed.*
>
> ***T***: *Under any of the programs there would still be anti-trust regulations regarding allocations and consolidation.*

P: In an IFQ system—all the fish would be accounted for so unreported bycatch would go away. The net effect—more fish would be available to harvesters and processors in the system.

> ***T:*** *This is a very difficult thing to analyze because we don't have good info on discard amounts.*

P: We may not sell shares, we may instead trade shares for one species to another. Will this be analyzed?

> ***T:*** *Yes. The starting assumption is that fishermen will be trying to get to a level where they will be harvesting the same amount by species they did before the IFQ.*

P: Are you building an assumption in that some harvesters will sell out and leave the fishery?

> ***T:*** *Yes.*

P: It is assumed that quota will migrate to the most efficient. How much conservation benefit can you ascribe to the initial allocation given that the very next day after implementation of IFQ, this will change?

> ***T:*** *Conservation benefit is applied to the overall program, not really related to initial allocations.*
>
> **P:** So whoever has the QS, the same rules regarding bycatch will remain in place? There are arguments made that there are no conservation benefits to processors, but in reality is it not correct that there is a conservation benefit from allocating to anyone, irrespective of who holds the QS?
>
> ***T:*** *Yes, this is the economic theory; if you have a dedicated access privilege, we assume there will be conservation benefits. [Other team members concurred.].*

P: Who is going to broker these shares?

> ***T:*** *It will likely be private businesses, done through same people that broker the other permits.*

P: NMFS would have to know about the transfer before it came into effect.

> ***T:*** *There need not be a broker involved as long as NMFS is notified.*

P: Consolidation Scenario 1—moderate fleet consolidation. Is this a reasonable definition of moderate consolidation? Is 150 days reasonable? 150 days is a lot of days. Moderate may be more like an average of number of days. 50 for the non-whiting fleet is high (now).

> ***T:*** *How many days on average now are people fishing?*
>
> **P:** 50-60 on average; maybe a little more.

P: 2005 OYs might be used as a guide when looking at consolidation. This is what is reflected in the most recent data set and may be more consistent to keep with this level of OY.

> ***T:*** *Will also be looking at the future extended out; but there is such uncertainty in knowing future OYs.*

P: OYs profile seems to change every time there is a Council meeting. How will this be managed? Will an average be used?

> ***T:*** *QP under this program will be assigned on the basis of the pre-season OY. If you are suggesting using an average of OYs as your base case, this has not been considered but might be for this analysis.*

P: 2005—boat made 31 trips of 2-3 days at sea and this is an average for groundfish.

P: 16-4 rebuilding provisions—OYs that emerge in 07-08 really inform what the constraining stocks will be like. Suggest not to go to 2005 as the base case because it is not realistic for the short run. We need to look at conditions when these species are partially or completely rebuilt.

P: It might not take very many vessels to catch everything, but in the future this may still be too many boats. Boats have to be profitable now or they will not be there in the future. Harvesters have to be able to get through a very low period anyway.

P: Are you assuming that allocations would go to permit holders as of the time of the application? So they would go to an individual, LLC or partnership?

> ***T:*** *Whoever registered the permit would get the allocation. So an owner who has more than one boat, can determine where the allocations go. Each permit holder will be assumed to be independent.*

P: Number of days fished may not be a good measure to use for consolidation. Maybe some other measure—how aggregated those shares are in terms of production. Constant number of boats but the steepness of that distribution curve is dramatic. Have you looked at other ways of looking at how to allocate?

> ***T:*** *Yes, we are looking at various ideas for distributing catches after consolidation. It is difficult to estimate how much consolidation would occur. Best option now for the analysis is to contrast high and low amounts of consolidation and compare them. This is a "what if" scenario, not a prediction.*

P: The relative level of consolidation that is going to occur through this program is going to be more significant compared to the example you showed earlier.

P: What if consolidation happens in the first year? What if it happens over the next five years? Impacts seem much more significant if the consolidation happens quickly rather than over longer periods of time.

> ***T:*** *Are these reasonable time ranges for scenarios? (Nodding heads).*

P: It may be necessary for you to analyze this in terms of number of days at sea, this seems reasonable. Make a guess of 100-110 days at sea as a best estimate depending on what area you are from etc. But in the first slide—what is missing here is money. How much you have to consolidate depends on the revenue you can make and how much money is available for people to make choices. Observer monitoring program is a significant cost that will drive accumulation. How much you accumulate is going to depend on revenues and costs on an individual basis but also by how capitalized the fishery is. Crab Fishery (AK) badly capitalized fishery. Pollock—10 to 15% consolidation but most of them probably shouldn't have been there in the first place (minor consolidation). From a revenue standpoint, the boats that will be left will be profitable. Doing this with number of days at sea, better information might be a better way to go.

P: New Zealand—Maori Tribe example—consolidation is a key issue for this trawl IFQ program. The fisherman in New Zealand did not think they would be forced out very quickly but they didn't get enough initial allocation or the processors just kept lowering the price, wait it out over time and could wait until fishermen went out of business. Accumulation limits are options that have been put forth by the Trawl IFQ Committee.

P: When you do the social analysis using no cap on consolidation—will you look at how this will affect communities?

> ***T:*** *Yes.*

P: There may be a biological impact to consolidation too, I assume you would identify spatially where consolidation would occur at different levels; possibility of depletion of subpopulations of fish.

> ***T:*** *Yes, this will be covered in the analysis.*

P: Lessons learned from New Zealand—Have effective accumulation caps, something that could be monitored and enforced, keep shares out of processors hands if possible, put a freeze on transfers in the first year or two so people can get used to the system before trading or selling.

P: The IFQ Committee was using Bruce C. advised to freeze transfers in the first year; this is a good point. This is a side option in the alternatives that would be analyzed.

P: Economic forces—seems that you will have incentive to maximize your efficiency. I'm unclear what the incentive to maintain smaller vessels would be?

P: In terms of consolidation on processing—if you do give shares to processors, first you have processors with fewer vessels to do business. Need an analysis of some kind of rent extraction with this scenario.

P: The suggestion has been made that there is conservation benefit to consolidation—this will not be the case. We need to look carefully at what conservation benefit is to initial allocation, and various allocation scenarios and whether there is a disproportionate impact on those that get certain allocations.

9 Workshop Wrap Up Session

For the Workshop Wrap up, the Project Team asked the Participants two final questions: *What haven't we talked about? What needs more discussion?* The resulting discussion is summarized below.

P: NRC Committee discussion—The term or the length of the property right? This would allow for correcting some of the bad things that could happen--they could be renegotiated and changed in the future.

P: Problem Statement—We didn't talk about this much at all. Shortcoming of this process. Maybe this is more of a Stage 2 issue, but a more in-depth discussion on this is warranted.

P: Some analysis of how we deal with the really low OY species (canary rockfish); how to manage an IFQ over an entire year that could affect the entire fleet.

P: Averaging by Days—geographically—there are areas that fish by days at sea; not really trips at sea. But this varies depending on the area (north versus south) due to continental shelf, fishery, etc…

P: Bycatch discussion—how would this program impact other sectors—also concern of overfished species, what kind of effects of other fisheries going over their limit for overfished species and how that will impact this system.

P: The real issue here is the biological limitations, needs of the resource, how these systems would solve or address these issues and how they would be good or bad. We need to focus on the biological needs of the resource.

P: We discussed status quo a lot—seems that not many or no one would go out of business under status quo. Under this new system, seems like many people would. Why can't we just tweak status quo instead of this radical change? Seem to be too many more questions than there are answers. This has been a good learning process for me as a fisherman to understand what the potential impacts of this might be. Discussing shares like it is not a big deal and it really is.

P: A major option missing—annual allocation to each permit within the context of the current limited entry fishery. There are only five alternatives and this one seems rather simple to analyze and it is missing. This should be sent back to Council.

P: I agree with this comment (above). It would be a shame if we get nothing out of this process. Interim steps to the IFQ program would be better and we need to analyze these as options; they are currently not included for analysis in the EIS.

P: Buy back program taught lessons on what happens. This will be the same situation; it will be important to analyze the effect of having that capital in people's hands and how it can be detrimental to other fisheries. As fleet consolidates and people get laid off there will be a huge impact on the communities and the support infrastructure. (Deck Hand Layoff example)

P: Crab and tuna example—those fisheries are at capacity will lead to limited entry, pot limits; those opportunities are just not there as they were when we first started looking at this. This should be part of the community impact assessment.

P: Senate Bill introduced last year, Congress could approve a whiting IFQ program, how would Council handle two IFQ programs at the same time. Are we wasting our time with this one if the whiting IFQ happens? When Congress finishes work on this, it isn't finished, NEPA analysis would have to take place. So how would this mesh with what we have to analyze for this program?

> ***T:*** *We would do an analysis of how these programs would mesh and the Council would have to look at this separately.*

P: Enforcement for adjacent states would have implications. I have concerns about this. The analysis needs to look at more detail on what the current capacity/infrastructure is for adjacent states. This is going to increase enforcement costs for these states. Some of this would be multiplied when you start issuing different types of shares (vessel shares, processor shares, etc.) There is currently no infrastructure to enforce this IFQ program right now.

> ***T:*** *We do have an enforcement group that is analyzing this issue right now and though it is not currently in the Analytical Document, this will be part of the EIS. Many other studies separate from this analysis will be included in the final EIS.*

P: Those things that have already been rejected; there is potentially meritorious arguments for how they should have been included. How does this stand up to legal challenge. How do you justify them being dismissed?

> ***T:*** *This is difficult to ensure. The best approach is to accurately provide the rationale behind these decisions in the Council record. Nothing is final until the ROD is signed by the Secretary of Commerce. The EIS must clearly document the purpose and need and the reasonable range of alternatives and provide the justification for what is analyzed in the document and what is not.*

P: Was it the Council that decided to put other options aside?

> ***T:*** *The Committee provided their suggestions to Council and then, after review, the Council adopted how to go forward in this process.*

Appendix A: Workshop Presentations

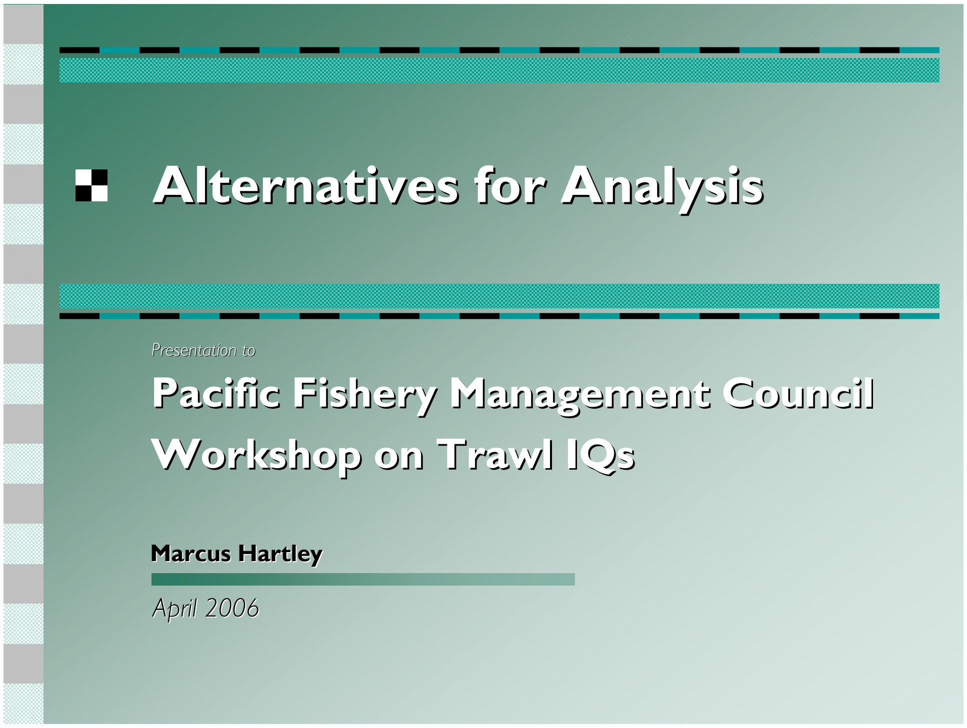
Section | Page

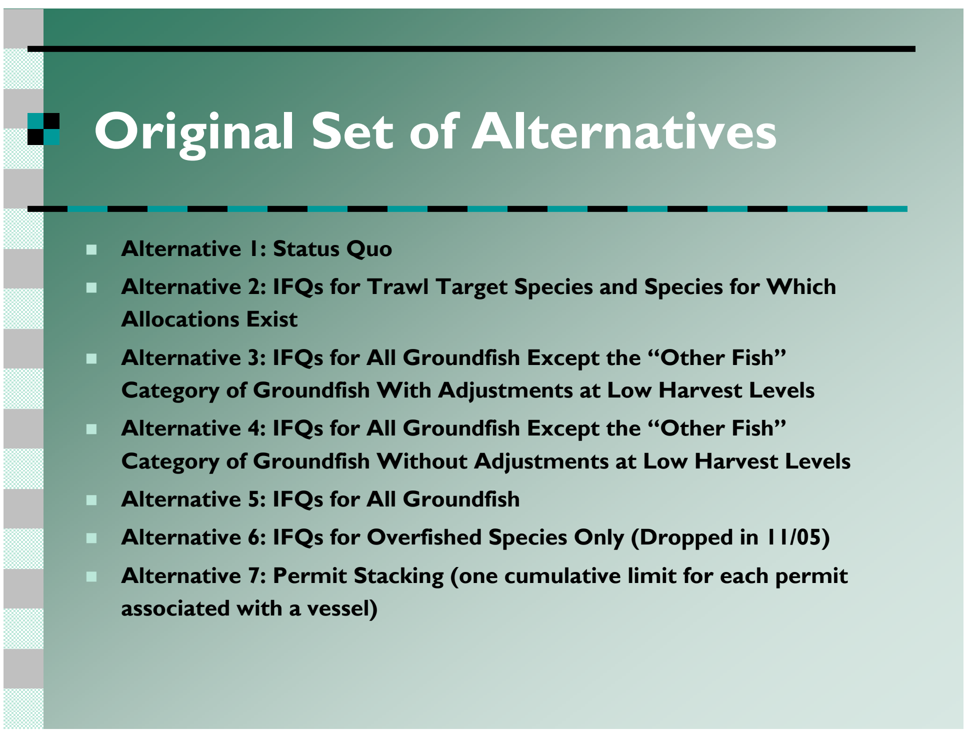
Alternatives for Analysis

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Marcus Hartley (Northern Ecconomics) during the

Morning Session on; April 18, 2006


Alternatives for Analysis
Presentation to
Pacific Fishery Management Council
Workshop on Trawl IQs
Marcus Hartley
April 2006


Original Set of Alternatives
Alternative 1: Status Quo
Alternative 2: IFQs for Trawl Target Species and Species for Which Allocations Exist
Alternative 3: IFQs for All Groundfish Except the "Other Fish" Category of Groundfish With Adjustments at Low Harvest Levels
Alternative 4: IFQs for All Groundfish Except the "Other Fish" Category of Groundfish Without Adjustments at Low Harvest Levels
Alternative 5: IFQs for All Groundfish
Alternative 6: IFQs for Overfished Species Only (Dropped in 11/05)
Alternative 7: Permit Stacking (one cumulative limit for each permit associated with a vessel)

Current Set of Alternatives

- **Alternative 1:** No Action Alternative
- **Alternative 2:** Manage with IFQs for Whiting and Trawl Target Species
- **Alternative 3:** Manage with IFQs for all groundfish except Other Species
- **Alternative 4:** Manage with IFQs for all groundfish species
- **Alternative 5:** Manage groundfish as under the No-Action Alternative but allow Permit Stacking

Alternative 1: The No-Action Alternative

- **Continues status quo management of groundfish species.**
- **Only limited entry trawl permit holders may fish for groundfish with trawl gear.**
- **Whiting are managed with special seasons and allocations to sectors defined by the processor of the whiting.**
- **Non-whiting groundfish, with the exception of Other Species, are managed with cumulative landings limits issued to all limited entry trawl permit holders every two months.**
- **Catches of Other Species of groundfish would be monitored. Other species include sharks (except spiny dogfish), skates, rays, ratfish, morids, grenadiers, etc. (Note: spiny dogfish, cabezon, and kelp greenling will likely be managed separately from Other Species)**
- **Reporting of at-sea discards of groundfish would not be required.**
- **If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors.**

Alternative 2: IFQs for Whiting and Trawl Target Species.

- **IFQs for Whiting and Trawl Target Species.**
- **Target species are those species for which a separate allocation for the trawl limited entry fleet has been approved.**
  - Definitive list of target species is currently unavailable.
- **Whiting seasons and sectors would be maintained, and an additional non-whiting sector would be established.**
- **IFQs are not issued for incidentally caught groundfish (species other than target species)—these are managed with transferable, bi-monthly cumulative catch limits.**
- **Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels.**
- **Catches of Other Species of groundfish would be monitored.**
- **For IFQ species, management does not change with low OYs.**
- **If the OY for a non-IFQ species becomes extremely low (such as for a rebuilding species) then the species would be managed with nontransferable cumulative catch limits.**

Alternative 3: IFQs for all Groundfish except Other Species.

- **IFQs for all Groundfish except Other Species.**
- **Whiting seasons would be eliminated, but whiting sectors would be maintained.**
- **Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels.**
- **Catches of Other Species would be monitored.**
- **Management if the OY for any species becomes extremely low—two options**
  - Management would switch from IFQs for that species, and instead the species would be managed under sector allocations as a pool using nontransferable cumulative catch limits to control catch.
  - Continue to manage with IFQs in low OY situations

Alternative 4: IFQs for all groundfish species

- IFQs for all groundfish species.
- Whiting Seasons would be eliminated.
- The distinction between whiting sectors would be eliminated.
- Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels.
- Other Species of groundfish would be managed with IFQs.
- If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species.

Alternative 5: Permit Stacking

- Manage groundfish as under the No-Action Alternative, but allow limited entry trawl permit holders to "stack" additional permits.
- Permit holders would be issued a full complement of cumulative trip limit pounds for each permit they own.
- Cumulative Trip Limits would be issued for total catch rather than total landings.
- Reporting of all groundfish catch would be required. At-sea monitoring would be required on all vessels.
- Whiting seasons and sectors would be maintained.
- Catches of Other Species would be monitored.
- If the OY for any species becomes extremely low, the Council may suspend allocations between gear sectors for that species

IFQ Specific Program Options for QS Allocation

- **Program A: Allocate 50 percent of QS to both harvesters and processors**
- **Program B: Three QS allocation options**
  - a) 100% to harvesters, 0% to processors
  - b) 90% to harvesters, 10% to processors
  - c) 100% of non-whiting to harvesters, 50% of whiting to harvesters, 50% of whiting to processors
- **Program C: Allocate 75 percent of QS to harvesters and 25 percent of QS processors**

IFQ Specific Program Options for Defining Processors

- **Program A: Processors are defined as those facilities that take ownership of, and process, unprocessed groundfish.**
- **Program B: Processors are defined as in the FMP—those facilities that process either unprocessed or already processed groundfish, or receive live fish for resale.**
- **Program C: Processors are defined as those facilities that take ownership of, and process, unprocessed groundfish.**

Application of IFQ Programs to Alternatives

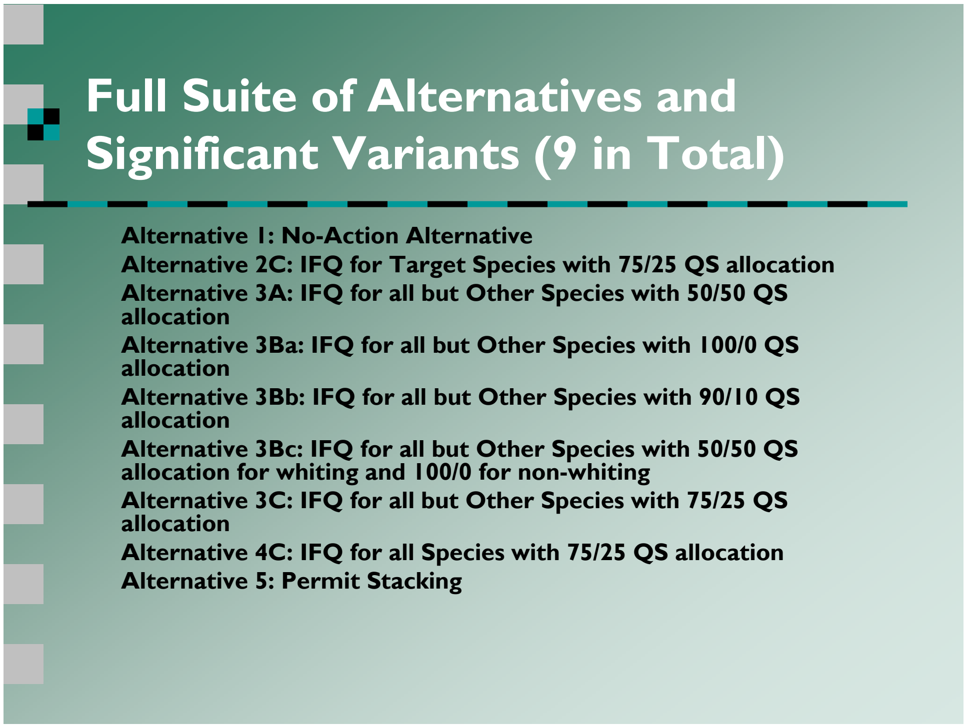
- Program A would be applied to Alternative 3
- Program B would also be applied to Alternative 3
- Program C would be applied to Alt's 2, 3, and 4

Note 1: Applying Program C to all three IFQ Alternatives allows the effects of the 75/25 QS allocation to be studied against three different management regimes.

Note 2: Applying Programs A, B & C independently to Alternative 3 allows the effects of three programs to be studied against a single management regime.

Variants of Alternative 3

- All three allocation programs (A, B, & C) are applied to Alternative 3.
- Program B contains three different QS allocation schemes; each of these has the potential to significantly alter the near-term impacts of the Alternatives.
- The end result is that Alternative 3 should be analyzed as five different Alternatives 3A, 3Ba, 3Bb, 3Bc, and 3C.


Full Suite of Alternatives and Significant Variants (9 in Total)
Alternative 1: No-Action Alternative
Alternative 2C: IFQ for Target Species with 75/25 QS allocation
Alternative 3A: IFQ for all but Other Species with 50/50 QS allocation
Alternative 3Ba: IFQ for all but Other Species with 100/0 QS allocation
Alternative 3Bb: IFQ for all but Other Species with 90/10 QS allocation
Alternative 3Bc: IFQ for all but Other Species with 50/50 QS allocation for whiting and 100/0 for non-whiting
Alternative 3C: IFQ for all but Other Species with 75/25 QS allocation
Alternative 4C: IFQ for all Species with 75/25 QS allocation
Alternative 5: Permit Stacking

Workshop Goals and Objectives

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Jon Isaacs (URS, Inc.) during the

Morning Session on; April 18, 2006

Fisheries Management and NEPA Compliance

- Changes to a Fishery Management Plan is a major federal action requiring compliance with the National Environmental Policy Act (NEPA)
- Alternatives are usually complex due to the number of species harvested and fishery participants
- This Stage I Analysis and Strategy precedes EIS preparation, but must anticipate needs

NEPA Compliance Objectives

- Supplement the existing authority of federal agencies
- Reform agency procedures to look at consequences of decisions
- Put environmental concerns on an equal footing with technical, social, and economic concerns
- Resolve environmental problems
- Foster intergovernmental coordination and cooperation
- Enhance public participation in government planning and decision making

Components of a NEPA Document

- Purpose and Need
- Alternatives, including the proposed action
- Affected Environment
- Environmental Consequences
- Mitigation Measures

Purpose and Need of Proposed Action

- Explains why the agency or applicant is proposing a specific action
- Must be compelling and make sense to the public
- Alternatives to the proposed action are logically and functionally linked to purpose and need

Alternatives

- Alternatives must meet purpose and need and provide a reasonable range contrast for NEPA analysis
- Need enough detail on proposed action and alternatives to assess environmental consequences
- Alternatives considered but eliminated from further analysis must be documented
- Scoping comments must be considered

Affected Environment

- Physical, biological and social environment
- Content linked to scoping and key issues
- Provides historical baseline information and trends on the affected resources
- Must provide enough information to address direct, indirect and cumulative effects
- Include quantitative information and information on trends
- Avoid unnecessary information

Environmental Consequences

- Organized by alternative or by affected environment topic
- Evaluate impacts on all issues for all alternatives
- Must address direct, indirect, and cumulative effects
- Can focus on certain categories of impacts and dismiss others, but must provide justification

Workshop Goals and Objectives: Council

- Describe the proposed approach suggested for analysis of alternatives and completion of the EIS
- Share it with members of the fishing community for feedback and suggestions for areas of improvement

Workshop Goals and Objectives: Consulting Team

- We want to know if what we are proposing to do is understandable and realistic
- Provide guidance on some key questions, major forces that may shape how the fishery responds to management alternatives
- Small breakout groups are proposed to address these issues

Workshop Goals and Objectives: Workshop Participants

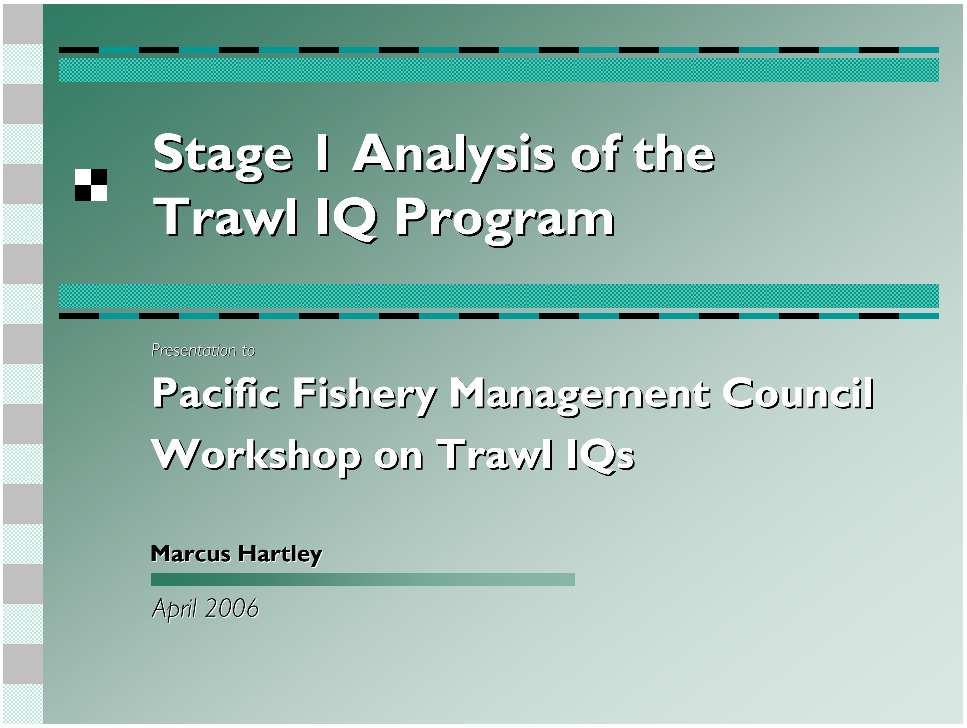
- Participant suggestions on workshop goals and objectives

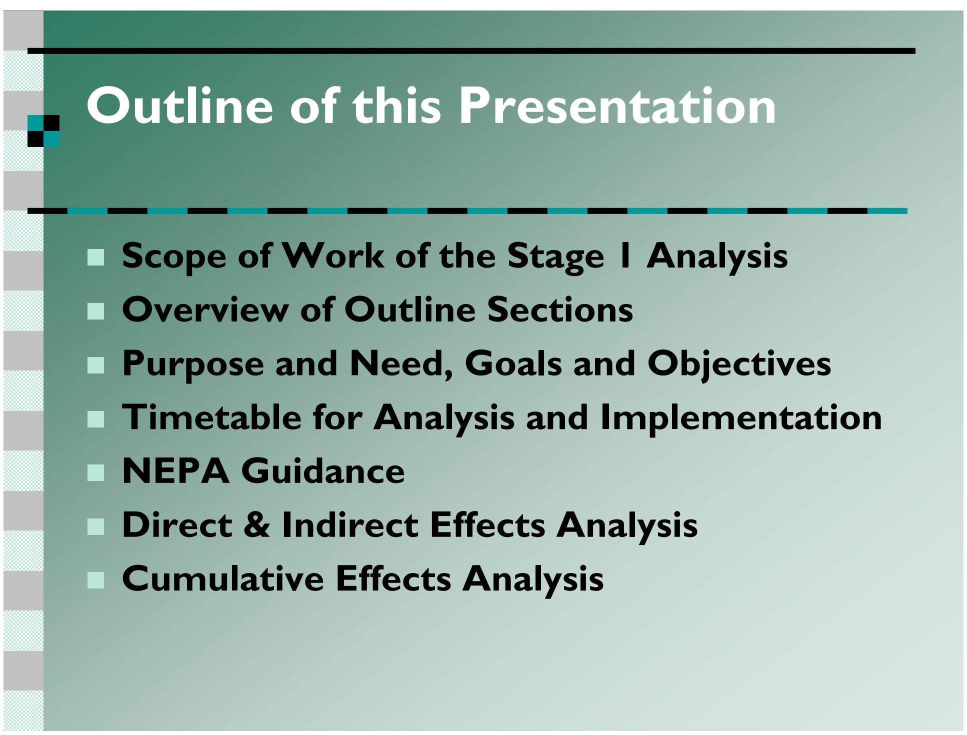
Analytical Framework for the EIS

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Marcus Hartley (Northern Economics) during the

Afternoon Session on; April 18, 2006


Stage I Analysis of the Trawl IQ Program
Presentation to
Pacific Fishery Management Council
Workshop on Trawl IQs
Marcus Hartley
April 2006


Outline of this Presentation
Scope of Work of the Stage I Analysis
Overview of Outline Sections
Purpose and Need, Goals and Objectives
Timetable for Analysis and Implementation
NEPA Guidance
Direct & Indirect Effects Analysis
Cumulative Effects Analysis

Scope of Work for the Stage 1 Analysis

- The first stage entails the development of the introductory chapters, outline, and analytical framework for the EIS/RIR/IRFA/SIA.
- It will entail the gathering of information and sufficient analysis to fully develop a detailed, specific and documented analytical framework approach to address each feature of the alternatives and their likely impacts, along with an assessment of the overall differences in impacts among the alternatives.

Scope of Work for Stage 2

- The second stage will be to complete the EIS, as well as RIR, IRFA and SIA
- Stage 2 will be based on the framework developed in Stage 1

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Chapter 1: Introduction

- Need for Action—Problems for Resolution
- Background to Purpose and Need
- Purpose of the Proposed Actions
- Goals
- Objectives
- Constraints and Guiding Principles
- Description of Proposed Alternatives
- Scoping Summary

Chapter 2: Analytical Framework

- Provides a summary of the analytical framework used in the analysis.
- Includes a list of affected resources along with an initial description of indicators and significance criteria.

Chapter 3: Resource and Stakeholder Profiles

- Will provide (in Stage 2) summary profiles of affected resources and stakeholder groups showing historical and baseline conditions

Chapter 4: Components Analysis

- The components table deconstructs the alternatives into component parts consisting of elements, options, and sub-options that combine together to create the proposed alternatives.
- The components analysis will examine (in Stage 2) individual elements, options and sub-options, including some options and sub-options that have not specifically been included in the Alternatives
- In this chapter options and sub-options will be examined (in Stage 2) independent from the Alternatives.

Chapter 5: Direct and Indirect Effects Analysis

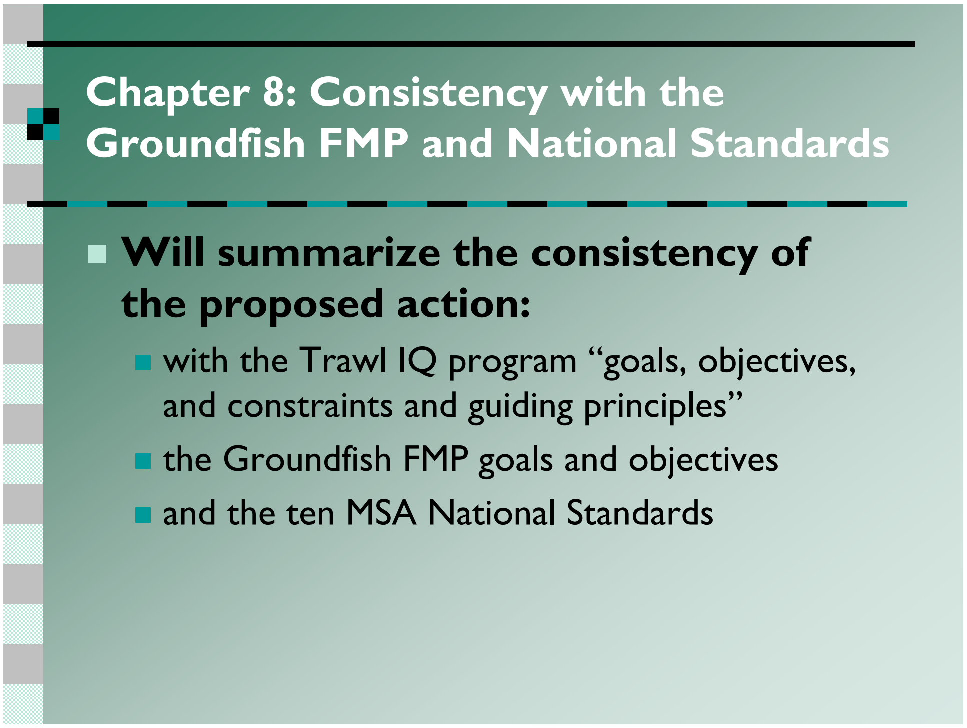
- The Stage 2 analysis will use a "resource-based" approach to examine direct and indirect effects of the Alternatives.
- In a "resource-based" approach, a single section of the document examines and describes the direct and indirect effects of all of the alternatives assessed for a particular resource or stakeholder group.
- The Alternatives will be examined holistically, as opposed to the single issue approach in the components analysis

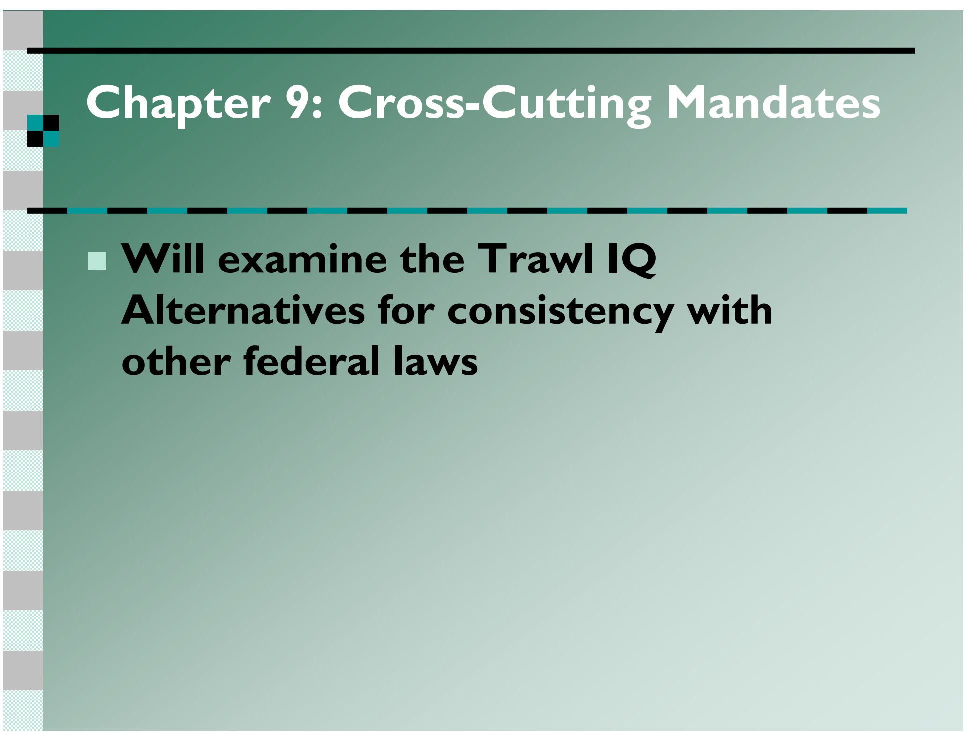
Chapter 6: Cumulative Effects Analysis

- Will contain the cumulative effects (CE) analysis.
- Will explicitly take into account reasonably foreseeable future events (RFFEs)—both endogenous and exogenous—that have the potential to create effects on affected resources and stakeholders.
- The CE analysis will follow the same general format as the direct and indirect effects analysis looking at the alternatives holistically from the perspective of each stakeholder/resource group.

Chapter 7: Summary of Other Environmental Management Issues

- **Will contain a review of other issues typically found in NEPA documents including:**
  - Short-term uses versus long-term productivity
  - Irreversible resource commitments and energy requirements
  - Conservation potential of the alternatives


Chapter 8: Consistency with the Groundfish FMP and National Standards
Will summarize the consistency of the proposed action:
with the Trawl IQ program "goals, objectives, and constraints and guiding principles"
the Groundfish FMP goals and objectives
and the ten MSA National Standards


Chapter 9: Cross-Cutting Mandates
Will examine the Trawl IQ Alternatives for consistency with other federal laws

Other Required Chapters

- Chapter 10: List of Preparers
- Chapter 11: Acronyms and Glossary
- Chapter 12: Literature Cited
- Chapter 13: Index

Appendix A: RIR

- **Regulatory Impact Review (RIR)**
  - Economic Analysis of the Alternatives
  - Initial Regulatory Flexibility Analysis (IRFA)

Appendix A: RIR (cont.)

- **Economic Analysis of the Alts.**
  - Net Benefits: Benefit-Cost Framework
    - Overall Change in B-Cs
    - Change in Distribution of B-Cs
  - Regional Economic Impacts:
    - Change in Income and Employment by Region

Appendix A: RIR (cont.)

- **Initial Regulatory Flexibility Analysis (IRFA)**
  - Impacts on Small Entities
  - Compliance Requirements/Costs
  - Additional Regulatory Burden
  - Conflicts with Other Federal Rules

Appendix B: Social Impact Assessment Technical Appendix

- **SIA two-pronged approach**
  - Summary tables based on quantitative information; presented in body of EIS/RIR; focuses on distribution of sectors across communities
  - Detailed community context information; presented in technical appendix; focuses on community engagement and dependency

Appendix B: Social Impact Assessment Technical Appendix

- **Balance of quantitative and qualitative**
  - Limits of available information
  - Range, direction, and likely order of magnitude of social and community impacts

SIA Technical Appendix Contents

- Introduction
- Overview of Trawl Community Socioeconomic Profiles
- Background and Methodology

SIA Technical Appendix Contents

- Community Variability
  - Location and Historical Ties to the Fishery
  - Community Socioeconomic Structures
- Social Impact Experience with IFQ or Other Rationalization Programs
  - Summary Review of Relevant Literature
  - Region-Specific Experience

SIA Technical Appendix Contents

- **Community Profiles**
  - Community #1
    - Community Demographics
    - Local Economy and Links to the Trawl Fishery
    - Community Revenues
    - Summary of Recent Community Rationalization Experience
    - Differential Impacts of Trawl Fishery Management Alternatives
  - Community #2 (and so on)

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Need for Action—Council Problem Statement

- **In summary, management of the fishery is challenged with the competing goals of:**
  - minimizing bycatch,
  - taking advantage of the available allowable harvests of more abundant stocks (including conducting safe and efficient harvest activities in a manner that optimizes net benefits over the short-term and long-term),
  - increasing management efficiency,
  - responding to community interest.

Goals

- **Increase regional and national net benefits including improvements in economic, social, environmental and fishery management objectives.**
- **Achieve capacity rationalization through market forces and create an environment for decision making that can rapidly and efficiently adjust to changing conditions.**

Objectives

- Provide for a viable, profitable and efficient groundfish fishery.
- Minimize negative ecological impact while taking the available harvest.
- Reduce bycatch and discard mortality.
- Promote individual accountability – responsibility for catch (landed catch and discards).
- Increase stability for business planning.

Objectives (continued)

- Increase operational flexibility.
- Minimize adverse effects from an IFQ program on fishing communities to the extent practical.
- Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
- Provide quality product for the consumer.
- Increase safety in the fishery.

Constraints and Guiding Principles

- **The Alternatives should strive to realize the goals and objectives…**
  - Taking into account the biological structure of the stocks including such factors as populations and genetics.
  - Taking into account the need to ensure that the total OYs and ABC for the trawl and all other sectors are not exceeded.
  - Accounting for total groundfish mortality.
  - Avoiding provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.

Constraints and Guiding Principles (continued)

- **The Alternatives should strive to realize the goal and objectives…**
  - Avoiding excessive quota concentration.
  - Providing efficient and effective monitoring and enforcement.
  - Designing a responsive review evaluation and modification mechanism.
  - Taking into account the management and administrative costs of implementing and overseeing the IFQ program and complementary catch monitoring programs and the limited state and federal resources available.

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Timeline for the Analysis Page 35

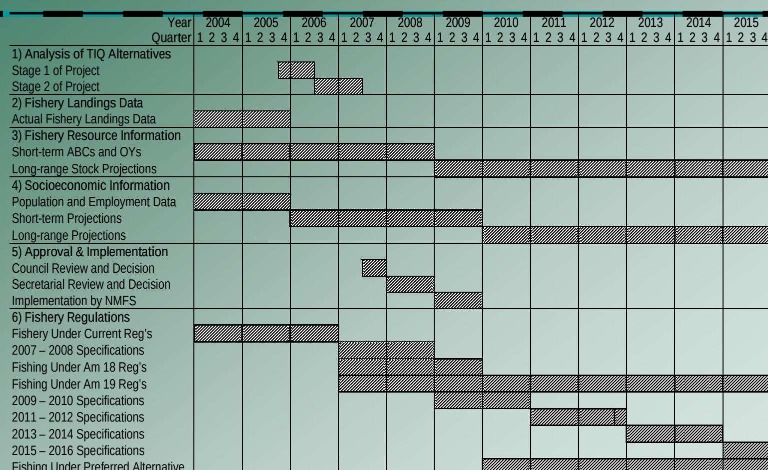

Figure 2.1 Details

- **Stage 1 and Stage 2 analyses take place through 2nd quarter of 2007. Final Council decision in 4th Quarter 2007**
- **Data to be used:**
  - Fishery data from 2005 will be used, along with information from earlier years.
  - The specifications containing ABC and OY projections for 2007 and 2008 will be used.
  - Population and employment estimates through 2005
- **Drafting of final EIS, FMP language, implementation plans, proposed rule, and the secretarial review and decision process will require at least a full year (2008).**
- **Implementation by NMFS will require 1 year, through 2009**
- **Fishing under IFQ Program could begin in 2010**

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Council on Environment Quality (CEQ) Guidance on NEPA

- Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect or cumulative.
- Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial.

CEQ: Direct and Indirect Effects

- "Effects" include:
- (a) Direct effects which are caused by the action and occur at the same time and place.
- (b) Indirect effects which are caused by the action and later in time or further removed in distance, but which are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Cumulative Impacts

- Cumulative impacts are the impact(s) on the environment which result from the incremental impact of the actions when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions.
- Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

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Analytical Conditons

- **Historical conditions**
  - Conditions of the resources and stakeholder groups for previous years
- **Baseline conditons**
  - The status of affected resources as of 2005.
  - Status of stocks, ABCs, OYs,
  - The numbers of vessels and processors, and ownership interests and residences of owners.
  - Community populations and employment reflect 2005 information.
  - The status of other affected resources and stakeholders as of 2005.
  - Trends will also be examined.
- **Differences in the baseline conditions and historical conditions will be noted and discussed**

Assessing direct/indirect effects: 3-Step Process

- **Examine & document the forces that are likely to change the baseline conditions of affected resources**
  - Forces are the aspects of the proposed alternative and how people will react to them
- **Project and predict the conditions of the affected resources after the forces from Step 1 have acted.**
- **Document how conditions have changed from baseline conditions in the case of the No-Action Alternative, or from the No-Action Alternative in the case of Action Alternatives**

Causes of indirect effects

- **Behavior changes of directly affected stakeholders cause indirect effects**
- **Examples:**
  - Harvest timing shifts to a period with lower incidental catches of overfished species, but the shift increases interactions with other species
  - A permit holder sells trawl QS allocation and increases effort in non-trawl fisheries
  - A change in product quality changes consumer willingness to pay

Assumptions under No-Action Alternative

- **No-action Alternative assumes fishery resources at 2007-2008 groundfish harvest specifications.**
- **All other resources, resource users and stakeholders will be assumed to start at baseline levels.**
- **The number of vessels and processors will mirror those seen in 2005,**
- **2005 ex-vessel and wholesale prices, community population etc., will be used**
- **All existing regulations as modified by actions that the Council has approved, but which have not yet been implemented by NMFS**
  - Includes Essential Fish Habitat measures
  - Assume Sector Allocations authorized under Amendment 18 will be in place.

Direct/Indirect Effect Analysis of the No Action Alternative

- **Step 1: Examine the forces that are likely to create changes in the conditions of the resources**

Major forces under the No-Action Alternative

- **Overfished species constraining harvest of target species reducing profits in the fishery**
- **No requirement to report discards so lots of uncertainty**
- **Low harvester profit levels make it difficult for harvesters to pay for observers/monitoring**
- **Cumulative trip limits preclude optimization of harvesting patterns for harvesters**
- **Cumulative trip limits ensure steady flow of fish to processors and consumer markets**
- **Lack of incentives to take individual action to reduce incidental catch**
  - Any savings the individual makes will accrue to the entire harvesting sector and not to the individual
- **Other Sectors can cause seasons to end**

Direct/Indirect Effect Analysis of the No Action Alternative

- **Step 2: Project the conditions of the affected resources after the forces from Step 1 have acted**
- **Methods**
  - Assume continuation of recent trends from baseline conditions
  - Interview harvesters and processors on other potential changes

Direct/Indirect Effect Analysis of the No Action Alternative (continued)

- **Step 3: Document how conditions have changed from baseline conditions**
- **The Stage 2 analysis will show the differences between outcomes under No-Action Alternative and baseline conditions**

Direct/Indirect Effect Analysis of Action Alternatives

- **Step 1: Examine the forces that are likely to create changes in the conditions of the resources.**
  - Changes in OYs—Stage 2 analysis will use 2007-2008 Specifications
  - Total catch reporting
  - Monitoring of catch with observers or video cameras
  - Other changes embedded in the Alternatives

Direct/Indirect Effects—Step 1 Other major forces under IFQs

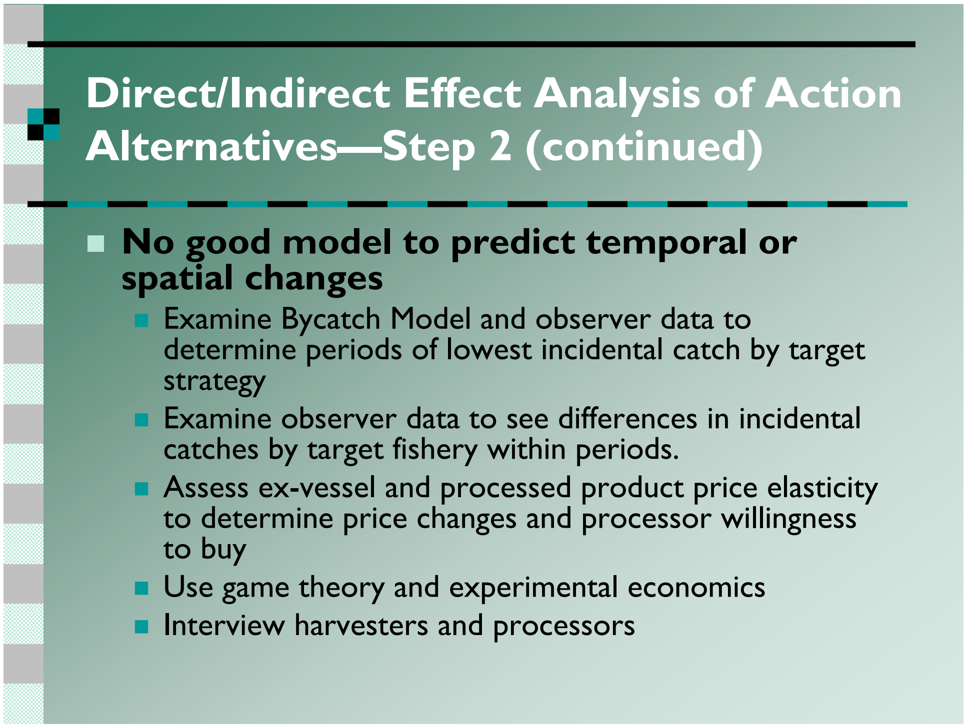
- **Allocation of QS/QP to harvesters and (potentially to processors) grants access to an annually determined quantity of fish**
- **IFQs allow the optimization of harvests of groundfish within the constraints of other regulations and market forces, including:**
  - markets for end products sold to consumers,
  - markets in which harvesters sell their catches to fish buyers and processors,
  - and new markets for QS and QP that are created by the program.

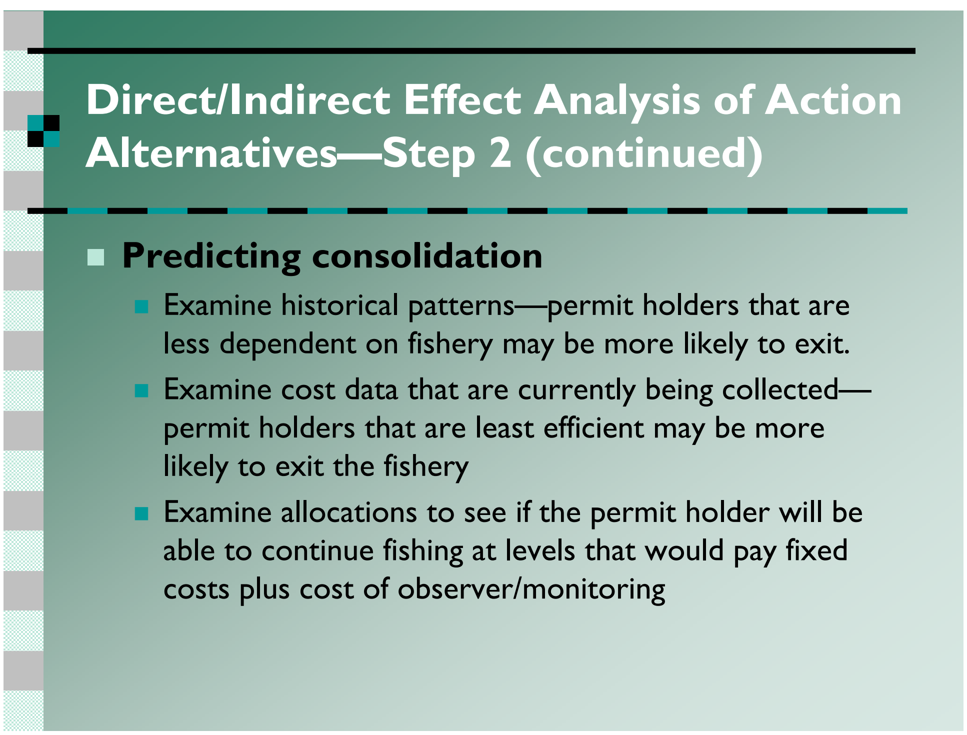
Direct/Indirect Effects of Action Alternatives—Step 2

- **Primary forces lead to behavioral changes creating direct and indirect impacts**
  - Incentives to reduce incidental catch so that greater amounts of target species can be harvested
  - Spatial and temporal changes in fishing patterns
  - Changes in the relationships between harvesters and processors
  - Initial allocation and consolidation will also alter fishing patterns and distribution of activities across the harvesting and processing sectors

Direct/Indirect Effect Analysis of Action Alternatives—Step 2 (continued)

- **How to Predict Changes**
  - Allocations are determined by formula
    - Compare Allocations to harvesting and processing patterns
  - Predicting changes in behavior patterns
    - Harvests are likely to shift to periods of lower incidental catch
    - Harvests are likely shift to areas of lower incidental catch
    - But will processors pay the same price for fish if all harvests take place in one period?
    - Will processors be able or willing to purchase and process in condensed periods of time?


Direct/Indirect Effect Analysis of Action Alternatives—Step 2 (continued)
No good model to predict temporal or spatial changes
Examine Bycatch Model and observer data to determine periods of lowest incidental catch by target strategy
Examine observer data to see differences in incidental catches by target fishery within periods.
Assess ex-vessel and processed product price elasticity to determine price changes and processor willingness to buy
Use game theory and experimental economics
Interview harvesters and processors


Direct/Indirect Effect Analysis of Action Alternatives—Step 2 (continued)
Predicting consolidation
Examine historical patterns—permit holders that are less dependent on fishery may be more likely to exit.
Examine cost data that are currently being collected—permit holders that are least efficient may be more likely to exit the fishery
Examine allocations to see if the permit holder will be able to continue fishing at levels that would pay fixed costs plus cost of observer/monitoring

Direct/Indirect Effect Analysis of Action Alternatives—Step 2 (continued)

- **Predicting cost of QS/QP**
  - What is the marginal revenue that can be earned by purchasing additional QS/QP
  - If the lack of QP for an incidental catch species is constraining target catches, then prices may be quite high and will be tied to the marginal revenue the target species, more than they will be tied to the value of the constraining species.

Direct/Indirect Effect Analysis of Action Alternatives—Step 3

- **Compare the projected conditions from Step 2 with the conditions projected from Step 2 of the analysis of the No-Action Alternative.**
- **Direct and indirect effects are the differences between the conditions under the Action Alternative and their respective conditions for the No-Action Alternative.**

Predictions and Scenarios

- The Consulting Team believes that reliable and robust mathematical or theoretical models that predict behavioral changes under the action alternatives will not be possible within the Council's time and budget constraints.
- Interviews with stakeholders may produce the best predictions.
- Analytical Scenarios will be a primary tool that will be used to assess direct/indirect effects.

Analytical Scenarios

- The scenarios would be developed as a means to demonstrate differences in the way the various alternatives perform under plausible conditions
- Scenarios are not predictions, but tools that will be used to demonstrate potential impacts

Scenarios that could be added to the No-Action Alternative

- Alternative Levels of Observer Coverage on Trawl Vessels
- Alternative requirements for the reporting of discards for trawl vessels

Scenarios applicable to both the No-Action and Action Alternatives

- High Abundance of Groundfish Species
- Low Abundance of Groundfish Species
- A stock that is currently not overfished falls into overfished status
- A stock that is currently in an overfished status is rebuilt
- Alternative sector allocations

Scenarios that could be added to the Action Alternatives

- Assume no transfers of QS occur
- Assume a moderate fleet consolidation: QS are transferred and vessels drop out of the fishery such that the average vessel remaining in the industry fishes an average of 150 days per year.
- Assume a high fleet consolidation such that the average vessel fishes 270 days per year
- Assume a very quick transition (1-year) to a moderately consolidated fleet
- Assume a relative slow transition (5-years) to a moderately consolidated fleet

Scenarios that could be added to the Action Alternatives (continued)

- Assume all harvests for primary target species are made in months with lowest incidental catch rates
- Assume all harvests for primary target species made in geographic areas with lowest incidental catch rates
- Assume no shift in temporal/spatial distribution, but assume all catch shifts to above average incidental catch rates

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Framework for Cumulative Effects Analysis

- CE analysis takes into account reasonably foreseeable future events (RFFEs)
- Future conditions related to each of the Alternatives will be based on exogenous RFFEs and endogenous RFFEs specific to each of those alternatives.

Step-wise Process for CE Analysis

- Step 1 examines and documents behavioral changing forces including those examined in direct/indirect analysis and RFFEs
- Step 2 projects the future conditions of the affected resources under the alternative after the forces from Step 1 have acted
- Step 3 documents how the future conditions have changed under the alternative.
  - In the case of the No-Action Alternative, the change is measured as the difference from the current conditions.
  - In the case of the Action Alternatives, the change is measured with respect to the Future Conditions under the No-Action Alternative.

Step-wise Process for CE Analysis (continued)

- Step 4 documents whether the status of any of the affected resources or stakeholder groups has, as a result of the combination of past, present, and reasonably foreseeable future events or actions, changed significantly in ways that were not already apparent in the baseline conditions

Affected Stakeholders and Resources

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Marcus Hartley (Northern Economics) during the

Afternoon Session on; April 18, 2006

Affected Stakeholders and Resources

Presentation to

Pacific Fishery Management Council Workshop on Trawl IQs

Marcus Hartley and Members of the Consulting Team

April 2006

Outline of Presentation

- NEPA Guidance
- Directly Affected Stakeholders
- Indirectly Affected Stakeholders
- Directly Affected Resources
- Indirectly Affected Resources

NEPA Guidance from CEQ

- Direct effects which are caused by the action and occur at the same time and place.
- Indirect effects which are caused by the action and later in time or further removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Application of CEQ Guidance to this Analysis

- Directly Affected Stakeholders are those stakeholders that would be specifically cited in the regulations
- Directly Affected Resources are those groundfish species for which IFQs or cumulative trip limits would be issued.
- All other stakeholders and resources are considered to be indirectly affected.

Directly Affected Stakeholders

- Limited Entry Trawl Permit Holders
- Processors of Trawl-caught Groundfish
- Managers of the Trawl Groundfish Fishery

Classes of Trawl Harvesters

- Offshore Whiting Trawl CV (OW-TCV)
- Inshore Whiting Trawl CV (IW-TCV)
- Combination Onshore-Offshore Whiting Trawl CV (CW-TCV)
- Large Diversified Trawl CV (LD-TCV)
- Small Diversified Trawl CV (SD-TCV)
- Trawl Catcher Processors (TCP)

Additional Details on Harvester Classifications

- Harvesters are classified because impacts will vary by class
- Classes attempt to group permit holders and vessels that have similar sets of activities.
- Classification will be made based on the landings of the permit holder and the vessel to which the permit is currently attached
- Catcher Processors are included because they would be issued IFQ under Alternatives 2, 3 and 4

Condition Indicators

- Condition Indicators are established for directly and indirectly affected stakeholders and resources
- The effects of the alternatives can generally be quantified by changes in the condition indicators
- The direction and magnitude of change are empirical issues
- Whether the change is significant is typically a judgment made by the analysts

Indicators for Trawl Harvesters

- Catch by species
- Incidental catch by species
- Discarded catch by species
- Distribution of catches by month
- Ex-vessel revenues from groundfish
- Operating costs
- Net revenues

Indicators for Trawl Harvesters (continued)

- Number of participating trawl catcher vessels
- Number of permit holders
- Distribution of permit holders by community
- Number of trips per year
- Number of fishing days per year
- Number of crew members
- Distribution of crew members by community
- Crew and skipper shares

Indicators for Trawl Harvesters (continued)

- Some effects of the alternatives may not be measurable by quantifiable indicators. These include impacts on vessel safety, market power vis-à-vis processors, and others.

Significance Criteria for Trawl Harvesters

- Whether a quantifiable change is significant is typically a judgment of the analyst
- Significance Criteria must be specified
- For trawl harvester indicators, the Consulting Team has made the judgment that a 20 percent change in the indicator will be considered significant

Landings of Bought-out Permit

- **The outline lists Bought-out Trawl Catcher Vessels as a directly affected stakeholder.**
- **Technically this is incorrect. Under the IFQ Alternatives, permit holders that remain in the fishery following the buyout would be allocated the catch history of bought-out permits. While the bought-out permit holders are not directly affected, their landings will be described in the same section as other harvest vessel classes.**

Processors of Trawl-caught Groundfish

- **Issues with Classification**
  - Fish Ticket data indicate first receiver of fish
  - Definition of processor in Alternatives is ambiguous
  - Treatment of Buyers that are not “processors”
  - Number of actual processors is relatively low
  - Confidentiality is an issue
- **Classification still an unresolved issue**
  - A separate workshop session will be held on this issue

Classes of Trawl Groundfish Processors

- Large Washington Processors of Trawl Groundfish
- Small Washington Processors of Trawl Groundfish
- Large Oregon Processors of Trawl Groundfish
- Small Oregon Processors of Trawl Groundfish
- Large California Processors of Trawl Groundfish
- Small California Processors of Trawl Groundfish
- Motherships
- Note that trawl catcher processors are treated as both harvesters and processors

Indicators for Processors of Trawl Groundfish

- Total purchases of trawl-caught groundfish by species
- Number of processors
- Distribution of purchases by month
- Distribution of processors by community
- Wholesale value of production
- Operating costs
- Net revenues

Indicators for Processors of Trawl Groundfish (continued)

- Product types and amounts by species
- Product recovery rates by product and species
- Operating days per year
- Number of processing crew
- Number of ownership entities

Indicators for Processors of Trawl Groundfish (continued)

- Some effects of the alternatives may not be measurable by quantifiable indicators, including impacts on market power vis-à-vis harvesters, and others.

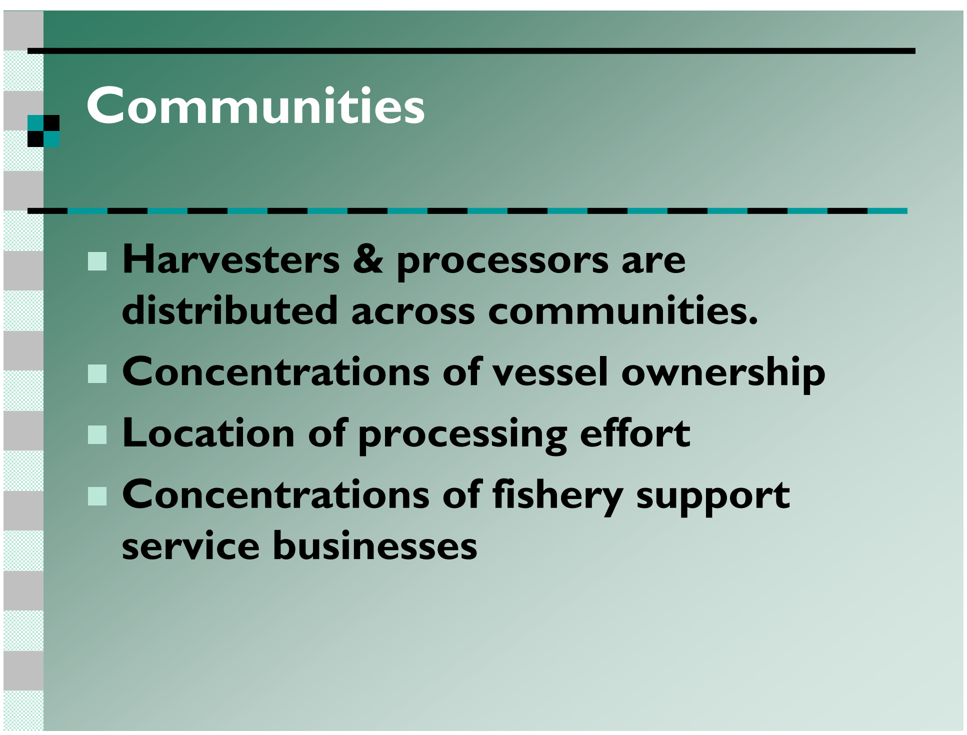
Directly Affected Management Agencies

- Pacific Fisheries Management Council
- NOAA Fisheries PNW Region
- NOAA Fisheries SW Region
- NOAA Fisheries Enforcement
- NOAA General Council
- Pacific States Marine Fishery Commission
- State of California
- State of Oregon
- State of Washington
- U.S. Coast Guard

Indicators for Management Agencies

- Management costs
- Enforcement feasibility
- Reliability of fishery data
- Risk to the resource


Indirectly Affected Stakeholders
Communities
Non-trawl Commercial Harvesters
Processors not involved in the Trawl Groundfish Fishery
Recreational Harvesters
Tribes
Input Suppliers, Wholesalers and Retailers
Consumers of West Coast Groundfish
The General Public


Communities
Harvesters & processors are distributed across communities.
Concentrations of vessel ownership
Location of processing effort
Concentrations of fishery support service businesses

Washington Communities

Region	Trawl Vessel Homeport
Northern Puget Sound	Bellingham
Northern Puget Sound	Blaine
Coastal Washington North	Neah Bay
Coastal WA South & Central	Westport
Coastal WA South & Central	Ilwaco/Chinook

Note: this is an initial listing

Oregon Communities

Region	Trawl Vessel Homeport
Astoria	Astoria
Tillamook	Tillamook & Garibaldi
Newport	Newport
Coos Bay	Coos Bay
Coos Bay	Florence
Brookings	Brookings

Note: this is an initial listing

Northern California Communities

Region	Trawl Vessel Homeport
Crescent City	Crescent City
Eureka	Eureka
Fort Bragg	Fort Bragg
Fort Bragg	Other Mendocino County
Bodega Bay	Bodega Bay
San Francisco	San Francisco
San Francisco	Princeton/Half Moon Bay
San Francisco	Other SF Area

Note: this is an initial listing

Southern California Communities

Region	Trawl Vessel Homeport
Monterey	Monterey
Monterey	Santa Cruz
Monterey	Moss Landing
Morro Bay	Morro Bay
Morro Bay	Avila
Los Angeles	Los Angeles
Los Angeles	Long Beach
San Diego	San Diego
San Diego	Oceanside

Note: this is an initial listing

Indicators of effects on Communities

- Change in distribution of harvesting-related activity
- Change in distribution of processing-related activity
- Change in distribution of fishery-related employment by sector
- Change in distribution of fishery-related income and revenue
- Change in distribution of fishery-related support service demand
- Changes in overall patterns of engagement and dependency based on previous indicators

Non-Trawl Commercial Harvesters

- **Non-Trawl Harvesters**
  - These may be indirectly affected because limited entry trawl harvesters also participate in other fisheries and rationalization of the limited entry trawl fishery may allow LE trawl permit holders to increase their participation in these other fisheries.
  - Limited Entry Fixed Gear Harvesters
  - Open Access Trawl Harvesters
  - Dungeness Crab Harvesters

Effect Indicators for Non-Trawl Harvesters

- Catch by species
- Distribution of catches by month
- Ex-vessel revenues from groundfish
- Number of participating catcher vessels
- Distribution of vessel owners by community
- Number of trips per year

Other Indirectly Affected Stakeholders

- Input Suppliers, Wholesalers and Retailers
  - Could see changes in sales and timing of sales
- Consumers of West Coast Groundfish
  - Changes in products, product quality, prices, availability
- The General Public
  - Non-use and existence value changes

Processors not involved in the Trawl Groundfish Fishery--Indicators

- **Change in total purchases of fish**
- **Change in number of processor facilities**
- **Changes in the relative market shares**
- **Change in average level of purchases**

Other Indirectly Affected Stakeholders

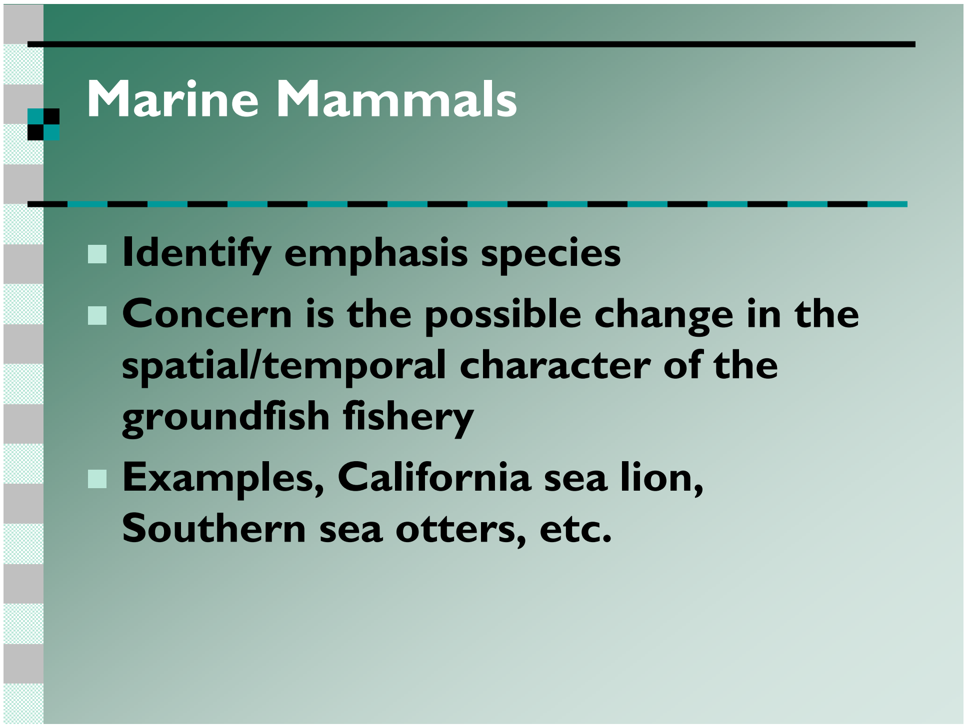
- **Recreational Harvesters**
  - Potential effects have yet to be identified
- **Tribes**
  - While not necessarily directly affected by federal and state management measures, they are directly involved in the Council process and craft their groundfish management measures in cooperation with federal and state managers

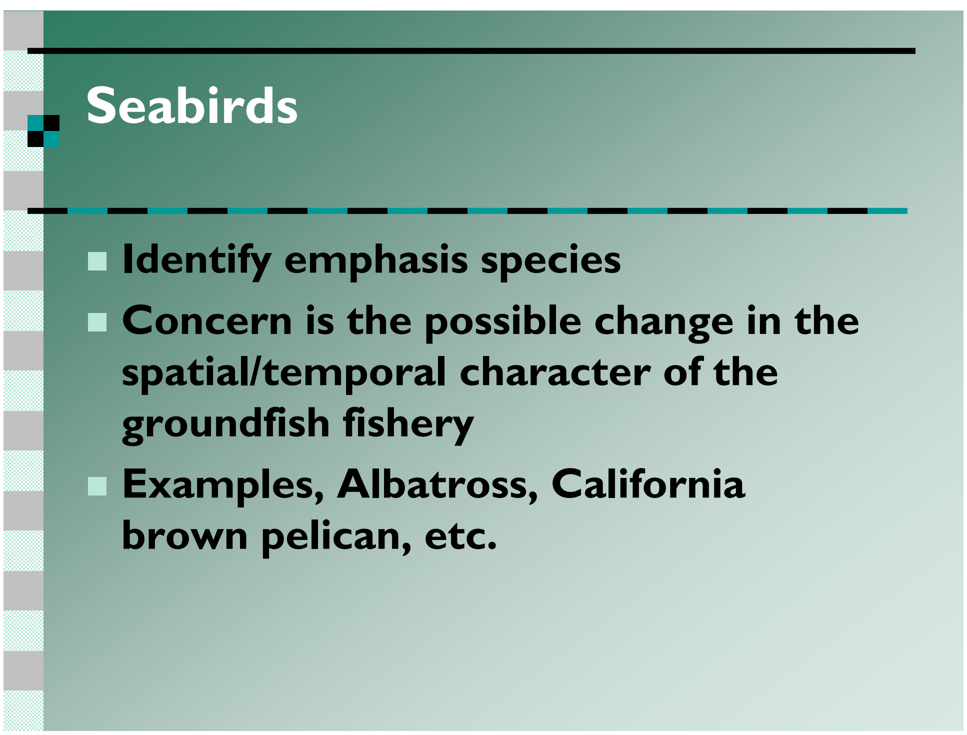
Groundfish Species

- Species broken up into two categories (overfished and non-overfished)
- Quota setting process will remain unchanged
- Of concern is the spatial/temporal character of the groundfish fishery

Other Affected Fish Resources

- Species caught incidentally in fisheries targeting groundfish
- Identify emphasis species; i.e. Pacific halibut, coastal pelagic species, etc.
- Concern is the possible change in the spatial/temporal character of the groundfish fishery


Marine Mammals
Identify emphasis species
Concern is the possible change in the spatial/temporal character of the groundfish fishery
Examples, California sea lion, Southern sea otters, etc.


Seabirds
Identify emphasis species
Concern is the possible change in the spatial/temporal character of the groundfish fishery
Examples, Albatross, California brown pelican, etc.

Other affected Protected Resources

- Identify emphasis species
- Concern is the possible change in the spatial/temporal character of the groundfish fishery
- Examples, salmon and other species protected by ESA

Habitat Areas

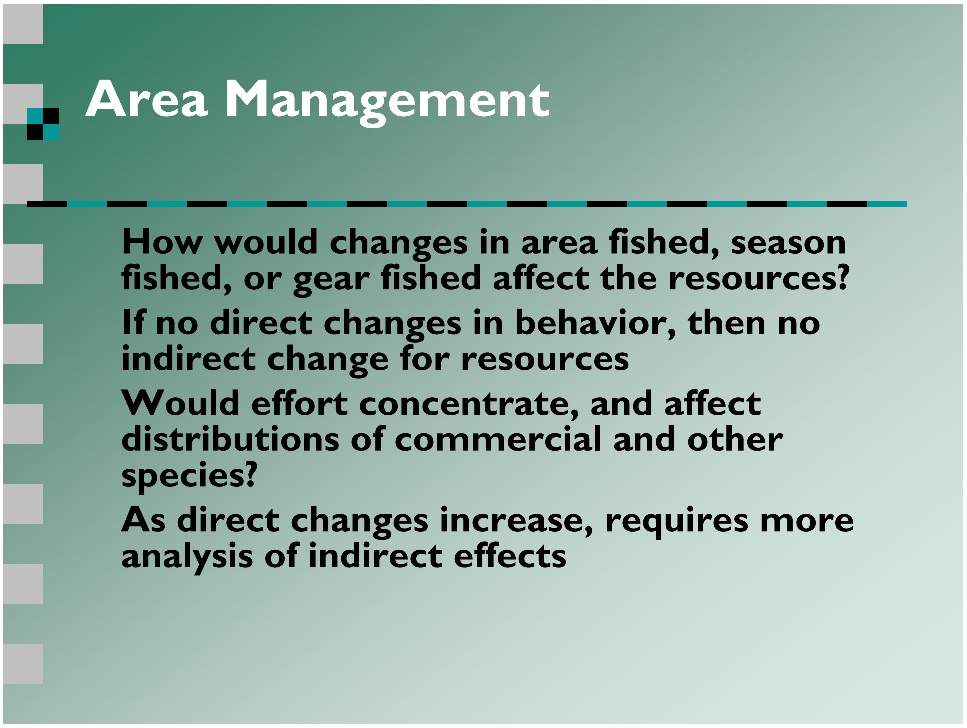
- Identified MPAs and areas closed to trawling
- No direct effects from Trawl IQ
- For areas closed to trawling, no indirect effects of trawling
- If change gear, may have indirect effects

Essential Fish Habitat

- **No direct effect of IQ on EFH**
- **Would fishers change area, gear?**
  - Want to assess indirect impacts relative to status quo?
  - Fish closer to port?
  - Fish farther away in higher CPUE?
  - Switch to longline?

Ecosystem Effects

- **No direct effects**
- **Want to assess relative effects of indirect changes from IQ– predators, prey, protected species, habitat**


Area Management
How would changes in area fished, season fished, or gear fished affect the resources?
If no direct changes in behavior, then no indirect change for resources
Would effort concentrate, and affect distributions of commercial and other species?
As direct changes increase, requires more analysis of indirect effects

No-Action and Permit Stacking Alternatives

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Marcus Hartley (Northern Economics) during the

Morning Session on; April 19, 2006

Forces and Mechanisms under No Action and Permit Stacking

Presentation to

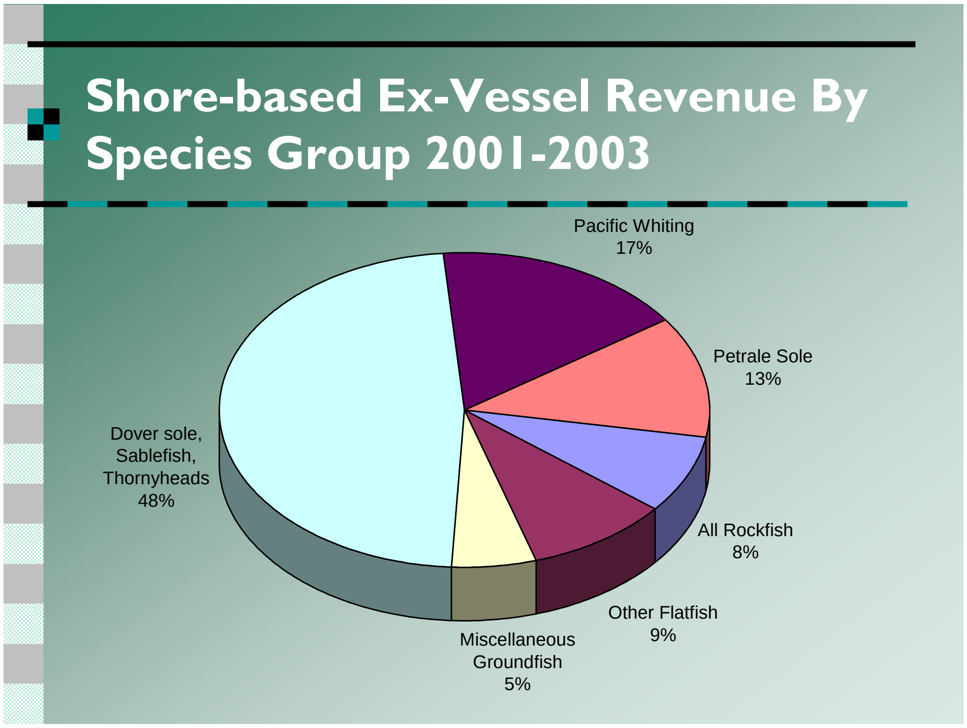
Pacific Fishery Management Council Workshop on Trawl IQs

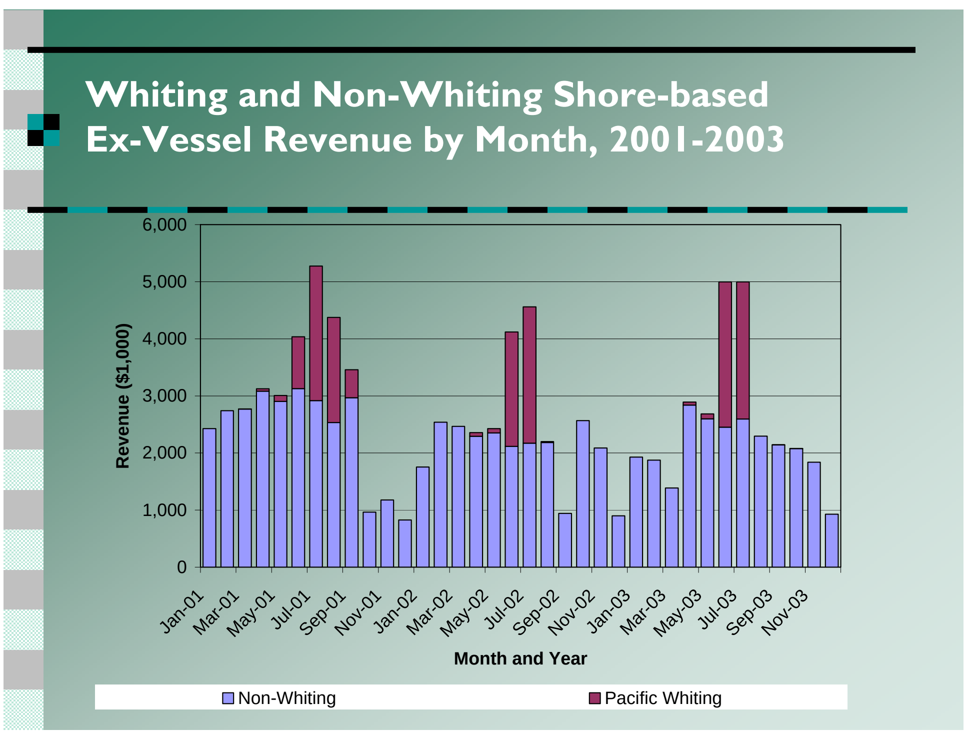
Marcus Hartley

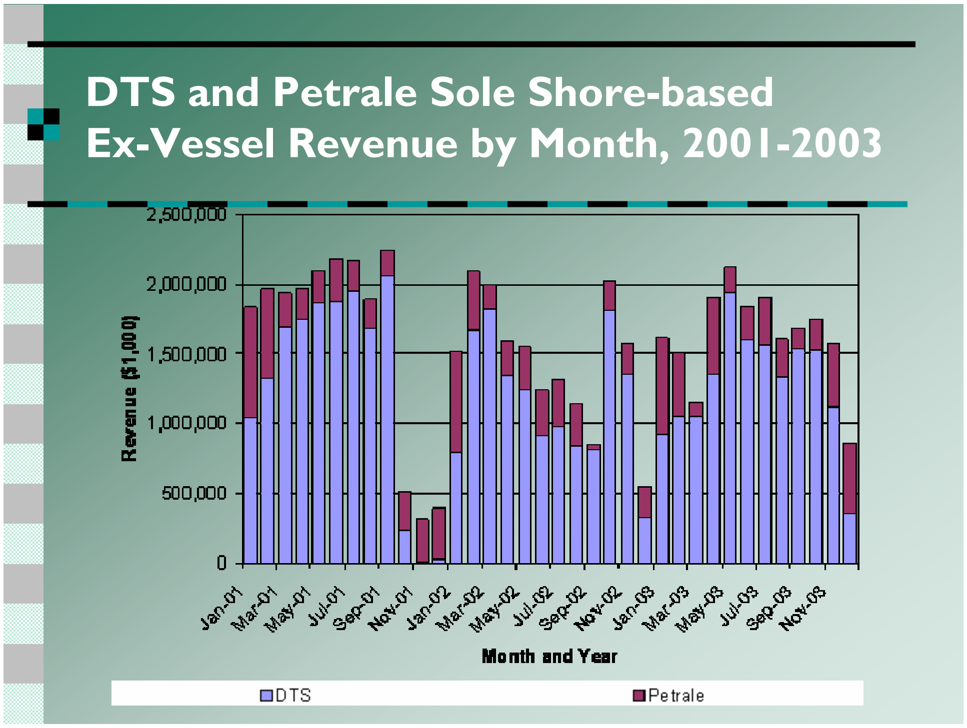
April 2006

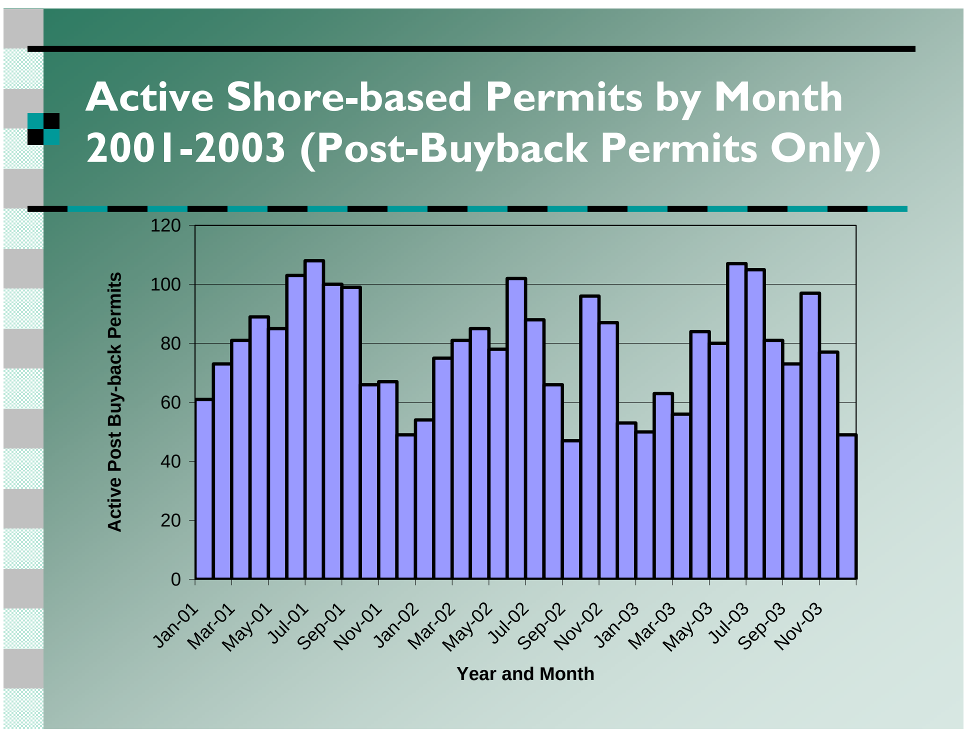
Status Quo Facts

- **After the Buy-back 170 active permits remain.**
- **Since 2001, there have been 135 active permits in shore based data.**
- **The Dover sole, Thornyhead, Sablefish (DTS) fishery is the largest by value among shore-based fisheries.**
- **The Whiting Fishery is largest by volume.**

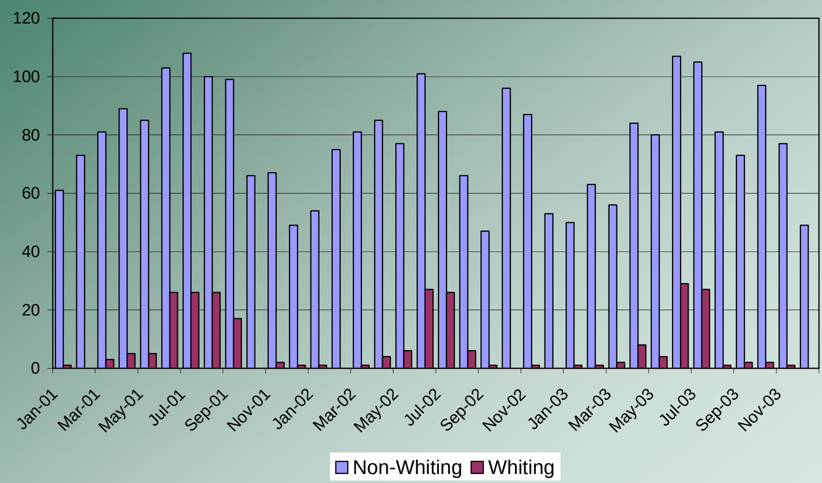

Shore-based Ex-Vessel Revenue By Species Group 2001-2003
Pacific Whiting 17%
Petrale Sole 13%
Dover sole, Sablefish, Thornyheads 48%
All Rockfish 8%
Other Flatfish 9%
Miscellaneous Groundfish 5%


Whiting and Non-Whiting Shore-based Ex-Vessel Revenue by Month, 2001-2003
6,000
5,000
4,000
3,000
2,000
1,000
0
Revenue ($1,000)
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02
Jan-03
Mar-03
May-03
Jul-03
Sep-03
Nov-03
Month and Year
Non-Whiting
Pacific Whiting

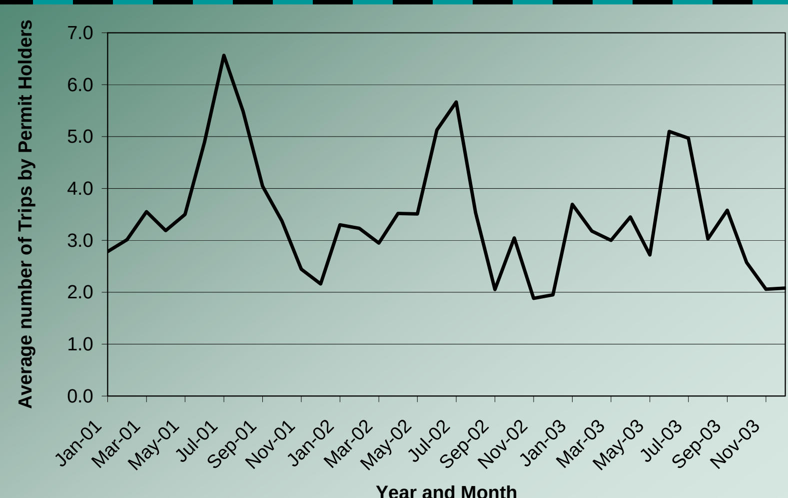

DTS and Petrale Sole Shore-based
Ex-Vessel Revenue by Month, 2001-2003
Revenue ($1,000)
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02
Jan-03
Mar-03
May-03
Jul-03
Sep-03
Nov-03
Month and Year
DTS
Petrale


Active Shore-based Permits by Month
2001-2003 (Post-Buyback Permits Only)
Active Post Buy-back Permits
120
100
80
60
40
20
0
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02
Nov-02
Jan-03
Mar-03
May-03
Jul-03
Sep-03
Nov-03
Year and Month

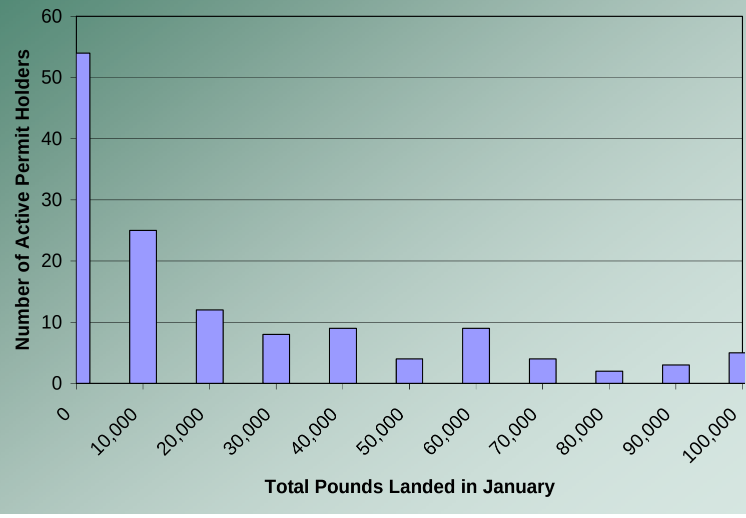
Shore-based Participation by Permit Holders in Whiting and Non-Whiting



Average Trips Per Month of Post-Buy-back Permit Holders in shore-based data



Catch of Active Shore-based Permit Holders in January 2001-2003



Decision to go Fishing

- Gross Revenue Potential
- Variable Cost Potential
- Fixed Costs

Gross Revenue Potential

- How much might be caught?
- Who will the buy the fish that are caught—does the vessel have a market?
- What is the vessel likely to earn in gross revenues?
- If not now, will the opportunity to fish be there tomorrow?
- What other fishing opportunities do I have?

Variable Cost Potential

- Gas / Diesel
- Crew
- Food
- Maintenance on vessel, engine, and gear due to wear and tear
- Time away from other opportunities to earn money
- Insurance
- Risk of injury and death

Fixed Cost—What does it cost to have the option to fish?

- Moorage
- Insurance
- Maintenance on hull and engine because vessel is in the water
- Annual permit charges
- Opportunity cost of capital

Decision of When and Where

- Not all permit holders fish every period
  - The Consulting Team thinks this may be weather related and related to other fishing opportunities—participation in non-whiting fisheries appear to increase during warmer months?
- What drives the decision to fish during a period?

Other Fishing Opportunities

- Dungeness Crab
- Limited Entry Fixed Gear
- Alaska Fisheries
- Open Access Trawl
- Open Access Vertical Hook and Line

Level of Effort and Landings in Month

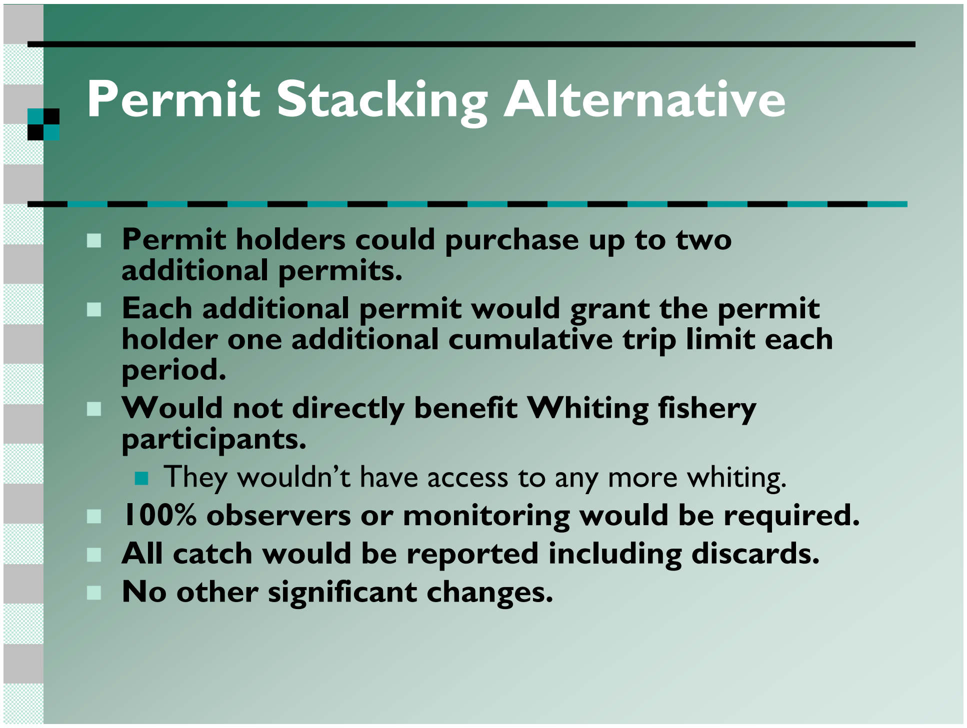
- The level of effort and the amount of Landings appear relatively inconsistent across participants.
- The Consulting Team thinks this may be a reflection of other fishing opportunities
  - Also influenced by innate abilities and drive.
- Difference could also be a lack of markets to sell fish?
- Is the fishing effort affected by homeport?
- Once the decision to fish is made, it doesn't appear that all permit holders fish to the same intensity.

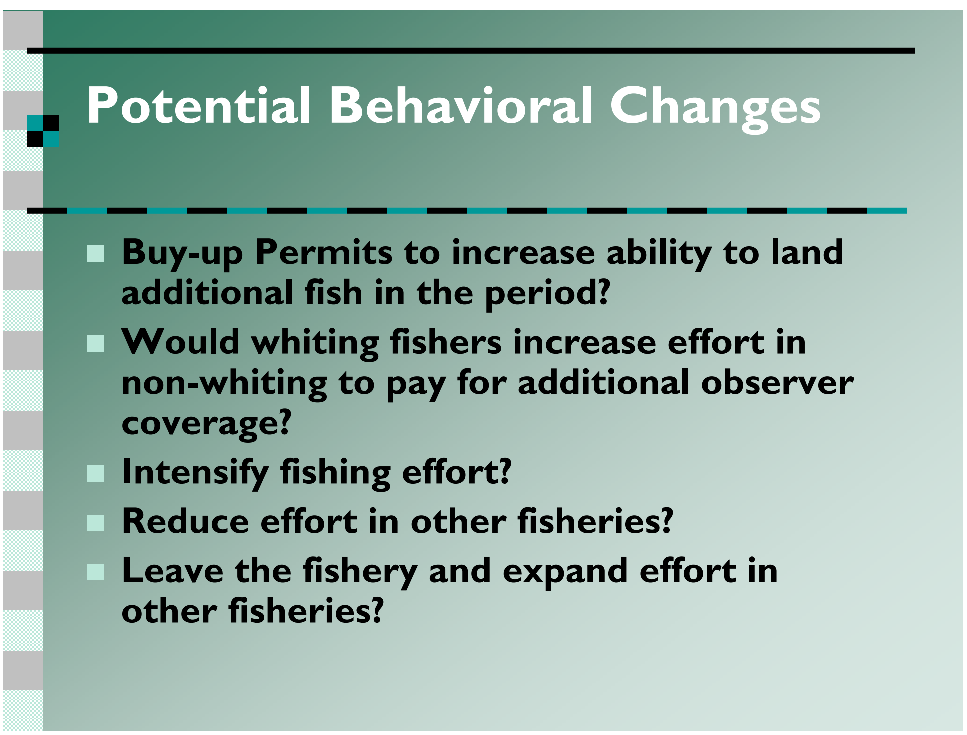
Incidental Catch

- **The Consulting Team thinks that some make a greater effort to reduce incidental catch than others**
- **Is this the case?**
- **Why?**

Relationship between harvesters and Processors

- **The Consulting Team has heard from some fishers and some processors that the processors place a high value on ensuring that fishers deliver all of their fish to them.**
- **The Consulting Team has heard that processors will often say something like…**
  - Yes, I will buy your low value fish, but in return you have sell me all of your high value fish, including species other than groundfish
  - Or, yes, I will buy your entire load of fish today, even though I don't really need it, but if I do buy it, you must always deliver to me or my company.
- **The Consulting Team has heard that the relationship between harvesters and processors is a long-term relationship—often there are no official contracts, but there are implicit contracts.**


Permit Stacking Alternative
Permit holders could purchase up to two additional permits.
Each additional permit would grant the permit holder one additional cumulative trip limit each period.
Would not directly benefit Whiting fishery participants.
They wouldn't have access to any more whiting.
100% observers or monitoring would be required.
All catch would be reported including discards.
No other significant changes.


Potential Behavioral Changes
Buy-up Permits to increase ability to land additional fish in the period?
Would whiting fishers increase effort in non-whiting to pay for additional observer coverage?
Intensify fishing effort?
Reduce effort in other fisheries?
Leave the fishery and expand effort in other fisheries?

How would the permit stacking program change relationships between harvesters and processors?

- **Describe the current relationship between harvesters and processors**
  - The Consulting Team has heard from some fishers and some processors that the processors place a high value of ensuring that fishers deliver all of their fish to them.
  - The Consulting Team has heard that processors will often say something like—Yes, I will buy your low value fish, but in return you have sell me all of your high value fish, including species other than groundfish

More Questions

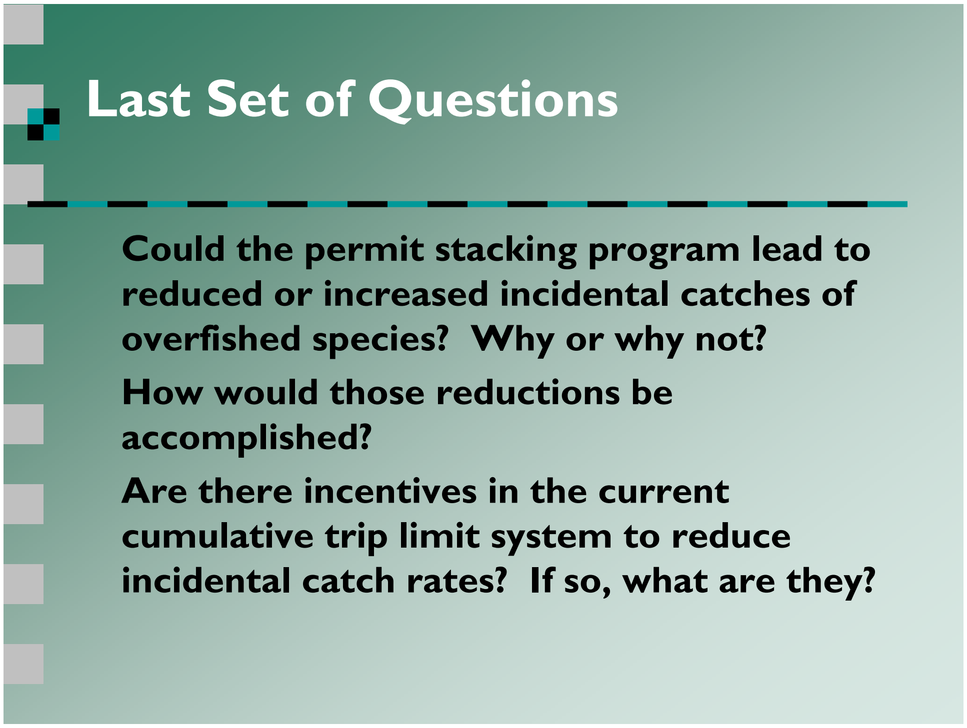
- **Would the permit stacking system provide any benefits to the whiting fishery?**
- **How would harvesters change the areas in which they fish under a permit stacking program?**

More Questions

- How will processors respond to a permit stacking program? Would they change the timing of their demand for inputs?
- What will be the effect of having to report 100 percent of the catch, ignoring for the moment the additional cost of the observer/video monitoring program?

Next to last set of Questions

- Now assume that the combination of video monitoring and observers will cost an average of $500 per fishing day.
  - Will it be necessary for harvesters to purchase additional permits to remain viable?
  - How would this change if more emphasis were placed on video monitoring, thereby reducing the costs of the observer/monitoring system.


Last Set of Questions
Could the permit stacking program lead to reduced or increased incidental catches of overfished species? Why or why not?
How would those reductions be accomplished?
Are there incentives in the current cumulative trip limit system to reduce incidental catch rates? If so, what are they?

IFQ Alternatives

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Marcus Hartley (Northern Economics) during the

Afternoon Session on; April 19, 2006

Forces and Mechanisms under IFQs

Presentation to

Pacific Fishery Management Council Workshop on Trawl IQs

Marcus Hartley

April 2006

Alternative 3: IFQs for all Groundfish except Other Species.

- **IFQs for all Groundfish except Other Species.**
- **Whiting seasons would be eliminated, but whiting sectors are maintained.**
  - 3 whiting sectors
- **Reporting of all groundfish catch would be required.**
- **At-sea monitoring would be required on all vessels.**

Assume Program C for Each Alternative

- 75 percent of QS to Harvesters
- 25 percent of QS to Processors
- Processors are defined as those facilities that take ownership of, and process, unprocessed groundfish

Processor & Harvester Relationships

- **Processors would be allocated 25 percent of the QP of all species under Alternative 4.**
  - How will these allocations of QS/QP be used by processors?
  - Would the allocation of QS/QP to processors make it more likely that harvesters would try to acquire additional QS?
    - If so, why?
  - How would the discussion change if processors were instead allocated …
    - 50 percent of the QS/QP?
    - 10 percent of the QS/QP?

How will Processors use QS/QP

- **One processor told us…**
  - He would provide the QP to the harvesters that he normally works with free of charge to ensure that they would deliver all their fish (all species) to him.
  - He would not lease them to his harvesters and would not pay a lower ex-vessel price
  - He would prioritize to most efficient vessels

How will Processors use QS/QP

- **One processor told us that…**
  - He would lease them to harvesters at the market rate paid for QP.
  - With IFQs, it's all about profit maximization

How will Processors use QS/QP

- **One processor told use …**
  - He would use them on his own vessels and use the extra profits to expand his fleet

Processor Behavioral Changes

- **Is it likely that processors would change the products they produce under an IFQ program?**
  - What kinds of changes might be made?
- **Is it likely that processors would change the timing of their purchase demands for particular species in an effort to reduce incidental catch and thereby increase target catches?**
- **What data are available with respect to products and product prices?**

Processor Use of QS/QP

- Mainstream economic theory assumes pure competition; therefore, questions of how processors use QS/QP cannot easily be answered.
- We would look at game theory and experimental economics to address these issues.

Whiting Fisheries Changes

- Whiting Seasons would be eliminated under this alternative. What would be the affect of this option on the program?
- Would you expect whiting vessels (that don't fish for other types of groundfish) to change behavior with respect to timing or areas fished to reduce incidental catch? How?

Spatial and Temporal Behavioral Changes

- **How would harvesters change timing or areas of fishing under this IFQ program compared to permit stacking?**
  - The Consulting Team thinks vessels will move to times and areas where the ratio of target CPUE to incidental catch rates is most favorable, subject to constraints of market demand from processors

Incidental Catch Behavioral Changes

- **What will be the effect of the IFQ program on incidental catches of overfished species?**
  - Will the IFQ program allow harvesters to reduce incidental catches?
  - How could these changes be accomplished?

More Whiting Behavioral Changes

- Would you expect whiting vessels that also fish for other types of groundfish to change behavior with respect to timing or areas fished in order to reduce incidental catch?

More on incidental catch

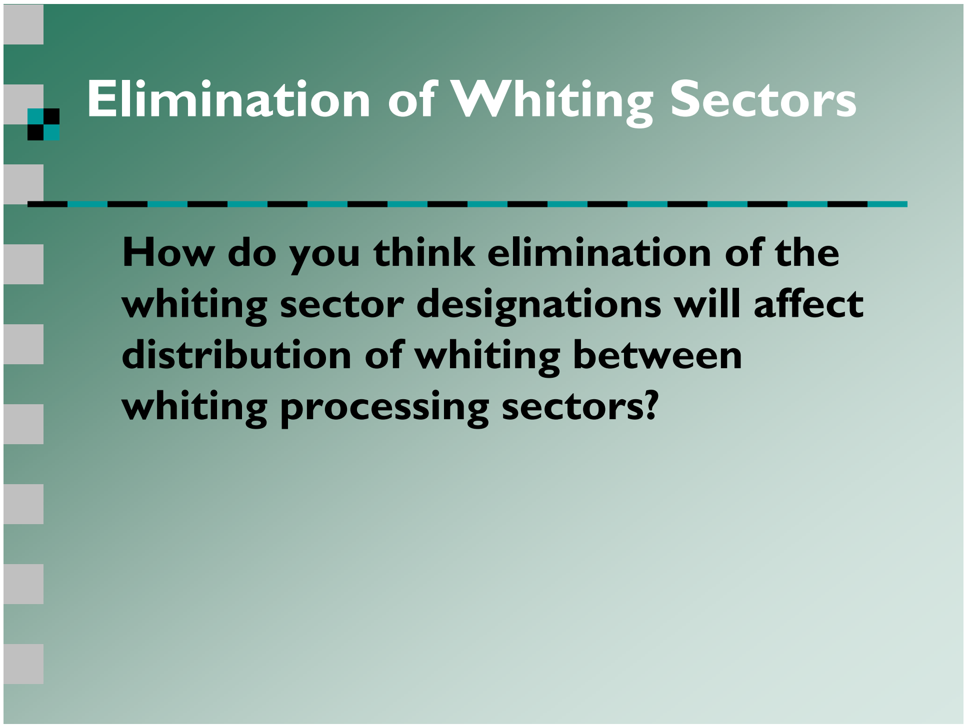
- How do you think groundfish-only vessels would change?
- How will the incentives for reducing incidental catch change?

At-Sea Monitoring Program

- **Remembering that the IFQ program includes an observer and monitoring program (assume a cost of $500 per day), is it likely that harvesters would need to purchase additional QS/QP to cover those additional costs?**
  - How would this change if more emphasis were placed on video monitoring, thereby reducing the costs of the observer/monitoring system?

Alternative 4: IFQs for all groundfish species

- **IFQs for all groundfish species.**
- **Whiting Sector designations would be eliminated.**
- **Whiting Seasons would be eliminated.**
- **Reporting of all groundfish catch would be required.**
- **At-sea monitoring would be required on all vessels.**


Elimination of Whiting Sectors
How do you think elimination of the whiting sector designations will affect distribution of whiting between whiting processing sectors?

Allocations to Processors

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Marcus Hartley (Northern Economics) during the

Morning Session on; April 20, 2006

Allocations to Processors: Definitions and Impacts

Presentation to

Pacific Fishery Management Council Workshop on Trawl IQs

Marcus Hartley

April 2006

IFQ Specific Program Options for Defining Processors

- **Program A: Processors are defined as those facilities that take ownership of, and process, unprocessed groundfish.**
- **Program B: Processors are defined as in the FMP—those facilities that process either unprocessed or already processed groundfish or receive live fish for resale.**
- **Program C: Processors are defined as those facilities that take ownership of, and process, unprocessed groundfish.**

The Problem

- Official data do not exist to produce a complete or accurate list of the entities that would be entitled to an allocation of QS/QP according to those definitions.
- Without a reliable indication of which entities would be entitled to QS/QP, the analysis of the impacts of the IFQ programs would be incomplete and be susceptible to legal challenge.

Processor-ID in PacFIN

- The term "Processor" developed in the alternatives differs from the way that data have been collected in the PacFIN Fish-Ticket data set.
- PacFIN's "Processor-ID" field, is more correctly described as "First Receiver ID"
- These entities may in fact be the actual processor of the fish, but they may also be agents of processors, independent buyers, restaurants, wholesale distributors, brokers, and possibly other types of entities.

FMP Definitions of Processors and Processing

- Definitions in the Alternatives implicitly rely on the definition of processing in the FMP. Specifically:

  "Processing or to process means the preparation or packaging of groundfish to render it suitable for human consumption, retail sale, industrial uses, or long-term storage, including, but not limited to, cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, but does not mean heading or gutting unless additional preparation is done."

FMP Definition Issues

- In the FMP definition, processors clearly do more than reselling or re-distributing fish.
- The FMP definition appear to disqualify all receivers of fish that simply resell the fish or redistribute the fish.
- However, the FMP definition of processing also specifically states that heading or gutting of a fish does note equate to processing.
- The FMP also implies that simply bleeding, gutting, heading, or selling whole fresh fish does not equate to processing.

Implications of the FMP

- The implication of the previous bullet is that, in order to determine if a fish has been processed, and therefore whether an entity is a processor eligible to receive QS/QP for that fish, NMFS must know specifically what was done to the fish after each entity takes possession of it.
- Those data do not exist!

Potential "Processors"

- Recipients of fresh fish that is whole, bled, gutted, or headed and gutted that undertake additional processing
- Restaurants, Grocery stores and Consumers might qualify, along with the entities that are typically thought of as "processors".
- Under both options, entities that are not located in the US, entities that are not owned by US citizens, and individuals that are not US citizens may actually qualify for QS/QP allocations.
- Finally it appears that under Program B, initial processors, secondary processors, tertiary processors and so-on could all qualify for QS/QP from a single fish.

Concerns from the EIS Perspective

- These concerns may have significant socio-political implications
- the Consulting Team is concerned that the issues have significant implications on the development of an EIS.
- All potential recipients of QS/QP would be considered directly affected, including restaurants and retail outlets that fillet fish and secondary processors.
- The scope of the EIS is significantly expanded by the definition of processors as currently stated in the Alternatives.

Example 1:

- "Joes," a facility in Newport, buys a load of flatfish from a vessel.
- Joes fillets 85 percent of the fish and sells them into the distribution chain.
- Joes fills a special order for whole fish for "Jacks," a high-end white tablecloth restaurant with the remaining 15 percent of the flatfish
- Chefs at Jacks fillet the flatfish at the diner's tables and pan-sear them to perfection.
- A strict interpretation of the FMP would mean that Jacks would be the Processor entitled to 15% of QS, while Joes would get 85% of the QS.

Example 2

- Joes freezes 500 lbs of thornyheads after heading and gutting.
- Joes sell to "Jims" in Bellingham,
- After storing, Jims refreshes and fillets them, and send them down to Jacks.
- Chefs at Jacks skin the fillets and cook them.
- By the definition in Program B, Joes, Jims, and Jacks have all processed the fish and would all qualify for 500 lbs worth of QS.

Consulting Team Option 1

- For purposes of allocation of QS/QP, two types of processors are defined:
  - At-sea Processors are those vessels that operate as Motherships in the Offshore Whiting fishery or those vessels permitted to operate as Catcher Processors in the Catcher Processor Whiting Fishery.
  - Shore-based processors are defined as those entities that are listed in the "Processor-ID" field of Fish-tickets.
- This is a simple and implementable approach that uses official data.

Consulting Team Option 2

- For purposes of allocation of QS/QP, two types of processors are defined:
- An At-Sea Processor is defined as an operation that while at-sea: 1) catches or takes delivery of whole groundfish; and 2) freezes or dries that groundfish; and 3) sells the fish into a wholesale market. All such fish shall be defined as "processed at-sea."
- A Shore-based Processor is an operation, working on US soil, that takes delivery of trawl-caught groundfish that has not been "processed at-sea" or that has not been "processed on-shore"; and that thereafter engages that particular fish in "on-shore processing."

Consulting Team Definition of Onshore Processing

- "On-shore Processing" is defined as any operation that takes place on shore; and that involves: 1) cutting groundfish into smaller portions; or 2) the freezing, cooking, smoking, drying of groundfish; and 3) packaging of groundfish for resale into 100 lb units or smaller for sale or distribution into a wholesale market.
- The purchase and redistribution into a wholesale market of live groundfish from a harvesting vessel is also defined as "on-shore processing."
- Entities that received fish that have not undergone "at-sea processing" or "on-shore processing" (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a "Processor" for purposes of QS/QP allocations.

Implementation of allocation for QS of Processing QS (Part 1)

- NMFS requests applications for QS
- All entities listed in At-Sea data or in PacFIN data in "Processor-ID" or equivalent fields are eligible to apply.
- All entities that believe they have met the definition of processing but which were not listed in the Processor-ID field, may also apply.

Implementation of allocation for QS of Processing QS (Part 2)

- Entities claiming to be a processors, but which were not listed in Processor-ID field, must provide sufficient evidence to NMFS to back up their claim that indeed they were the "Processor" of that fish.
- Therefore the only "unofficial" data that must be supplied is the special case where an independent buyer supplied "unprocessed" fish to the Claimant.
- Otherwise Official Data Sets would be used.

Caveats

The Consulting Team makes no claim that the definitions and concepts provided here would withstand legal challenge.

Community Impacts

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Mike Downs (EDAW, Inc.) during the

Morning Session on; April 20, 2006

Social/Community Impact Assessment Discussion

Presentation to

Pacific Fishery Management Council Workshop on Trawl IQs

Mike Downs

April 2006

Social/Community Impact Assessment

- **SIA two-pronged approach**
  - Summary tables based on quantitative information; presented in body of EIS/RIR; focuses on distribution of sectors across communities
  - Detailed community context information; presented in technical appendix; focuses on community engagement and dependency

Social/Community Impact Assessment

- **Balance of quantitative and qualitative**
  - Limits of available information
  - Range, direction, and likely order of magnitude of social and community impacts

Social/Community Impact Assessment

Background and Methodology

- NEPA (social and economic effects)
- MSA National Standard 8 (engaged, dependent, sustained)
- Executive Order 12898 (environmental justice)

Social/Community Impact Assessment

- **Community Variability**
  - Location and Historical Ties to the Fishery
  - Community Socioeconomic Structures
  - Engagement, Dependency, Resiliency, Vulnerability

Social/Community Impact Assessment

Social Impact Experience with IFQ or Other Rationalization Programs

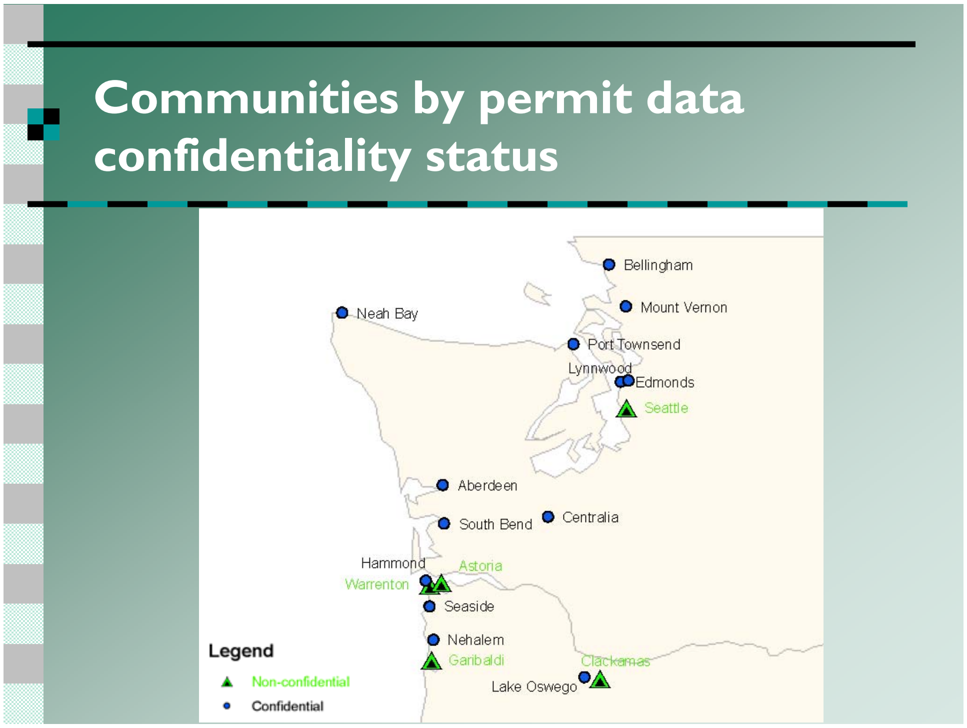
- Summary Review of Relevant Literature – lessons learned
- Region-Specific Experience – applying the lessons learned to the regional and fishery context

Social/Community Impact Assessment

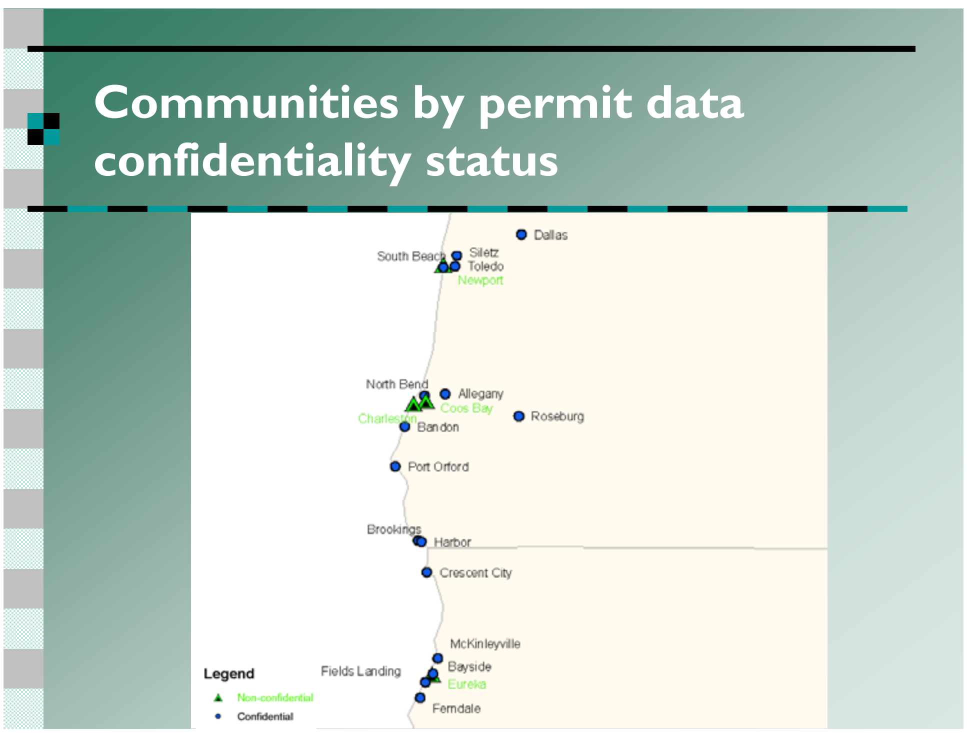
- **Community Profiles**
  - Community #1
    - Community Demographics
    - Local Economy and Links to the Trawl Fishery
    - Community Revenues
    - Summary of Recent Community Rationalization Experience
    - Differential Impacts of Trawl Fishery Management Alternatives
  - Community #2 (and so on)

SIA Analytic Challenge: Data Confidentiality

- **Need to aggregate fisheries data**
  - 4 or more entities
  - Counts versus common ownership



Communities by permit data confidentiality status
Bellingham
Mount Vernon
Neah Bay
Port Townsend
Lynnwood
Edmonds
Seattle
Aberdeen
South Bend
Centralia
Hammond
Astoria
Warrenton
Seaside
Nehalem
Garibaldi
Clackamas
Lake Oswego
Legend
Non-confidential
Confidential



Communities by permit data confidentiality status
Dallas
South Beach
Siletz
Toledo
Newport
North Bend
Allegany
Coos Bay
Charleston
Roseburg
Bandon
Port Orford
Brookings
Harbor
Crescent City
McKinleyville
Bayside
Eureka
Fields Landing
Ferndale
Legend
Non-confidential
Confidential

Communities by permit data confidentiality status

Confidentiality Example: Limited number of communities without harvester data restrictions

- **Oregon**
  - Astoria
  - Charleston
  - Clackamas
  - Coos Bay
  - Garibaldi
  - Newport
  - Warrenton

Communities without harvester data restrictions (continued)

- California
  - Eureka
  - Fort Bragg
  - Half Moon Bay
  - San Francisco
- Washington
  - Seattle

Data Confidentiality Issues: Processors

- Defining processors
- Confidentiality by location

Communities confidentiality methodological approaches

- Aggregation of communities based on proximity and socioeconomic ties (see map)
- Use of averaged data for communities with fewer than requisite number of entities

Anticipated Community Impact Drivers

- Vessel consolidation
  - Employment: loss of skipper and crew positions
  - Income: change in compensation structure
  - Support service businesses
  - Public revenues
- Processor consolidation
  - Employment/income processing employees
  - Support service businesses
  - Public revenues

Anticipated Community Impact Drivers (cont.)

- **Change in spatial distribution of effort and landing patterns**
  - What is logical to look for at this point?
  - Toward larger communities? Others?
- **Change in temporal distribution of effort**
  - What is logical to anticipate at this point?
  - How would this impact communities and support businesses?

Anticipated Community Impact Drivers (cont.)

- **Change number of vessels**
  - What is logical to look for at this point?
  - Toward larger vessels? Other attributes?
- **Change in number of processors**
  - What is logical to anticipate at this point?
  - Toward larger processors? Change in balance of larger and niche processors?

Community Options to be Analyzed

- Community Stability Holdback Option
- Community Involvement Option
- Existing Community Impact Control Mechanism Options

Community Stability Holdback Option

- **General**
  - Portion of annual QP held back and allocated for proposals submitted by IFQ holders [earlier: joint fishermen/processor venture proposals]
  - Proposals evaluated with priority on community benefits
  - Shares held back continue to be trawl shares

Community Stability Holdback Option (continued)

- **Holdback**
  - Up to 25 percent of total annual QP for [non-whiting] shoreside component of trawl fishery (but period may be greater than one year)

Community Stability Holdback Option (continued)

- **Committee**
  - Appointed by Council, recommendations approved by Council before being forwarded to NMFS
  - Role to make recommendations with the purpose of achieving community development, enhancement, or stabilization goals
  - Composed of representatives of West Coast regions, port districts, processors, and fishermen
  - Staffing by NMFS + Council (option A) or Council (option B)

Community Stability Holdback Option (continued)

- **Eligibility for Participation**
  - IFQ holders [previously joint fishermen/ processor venture proposals]; may work together in collaboratives.
  - IFQ holders may only participate in one proposal

Community Stability Holdback Option (continued)

- **Allocation Criteria**
  - To be developed, but quantitative in nature for consistent application to proposals
  - Potential criteria may or may not include:
    - Past performance (performance on past commitments)
    - Utilization (indicator of wastage and pollution externalities)
    - Local added value (value of exports divided by landings)
    - Local labor employment (percentage of local employees)

Community Stability Holdback Option (continued)

- **Potential Allocation Criteria (Continued)**
  - Local labor earnings (wages to product value ratio)
  - Public debt related to fisheries investment (fishery infrastructure debt relying on fisheries activity repayment)
  - Public investment dedicated to fisheries (total public investments supporting fishing industry)
  - Port dependence (proportion of total port revenue derived from fisheries activity)
  - Other (to be identified through public comment)

Community Involvement Option

- **Committee**
  - Convened by Council; composed of representatives of West Coast regions, port districts, processors, and fishermen
  - Make recommendations pertaining to IFQ program and its impacts to port districts, regions, processors, and fishermen

Existing Community Impact Control Mechanism Options

- Allowing communities to hold quota
- Setting limits on quota accumulation
- Allocations of whiting and non-whiting groundfish species for shoreside and at-sea delivery
- Temporarily prohibiting QS transfer after initial allocation (to be analyzed, but NOT a part of current alternatives)
- Distribute revoked shares or reclaimed quota to new entrants

Environmental Justice Analysis

- High and adverse impacts
- Disproportionately accruing to minority populations or low-income populations
- Populations vs. community (e.g. population pockets)

Consolidation

A PowerPoint Presentation Provided to the Trawl IQ Workshop

By Marcus Hartley (Northern Economics) during the

Afternoon Session on; April 20, 2006

Consolidation

Presentation to

Pacific Fishery Management Council Workshop on Trawl IQs

Marcus Hartley

April 2006

Forces that May Affect Consolidation of the Industry

- Initial Allocation
- Accumulation Caps
- Use Caps or Vertical Integrations Limits (none included)
- Sector Definitions
- Harvesting and Processing Costs
- Observer and Monitoring Costs

Initial Allocation

- **We heard in Small Group Sessions that the allocations to processors will affect consolidation in terms of:**
  - Who will buy QS
  - How fast consolidation will occur
- **If processors get 25% rather than 10%, those processors will be able to purchase more QS in the future.**

Economic Theory

- **Those to whom the QS are issued may be able to capture the extra rents in the fishery—not just in current period, but for all periods in the future.**
  - Note that perfect information of future stock sizes, future input and product prices, etc. would be required to extra all of the extra rent.
- **Purchasers of QS will be able to make normal business profits, but probably won't be able to generate extra rents, unless they made a really good purchase deal on QS.**

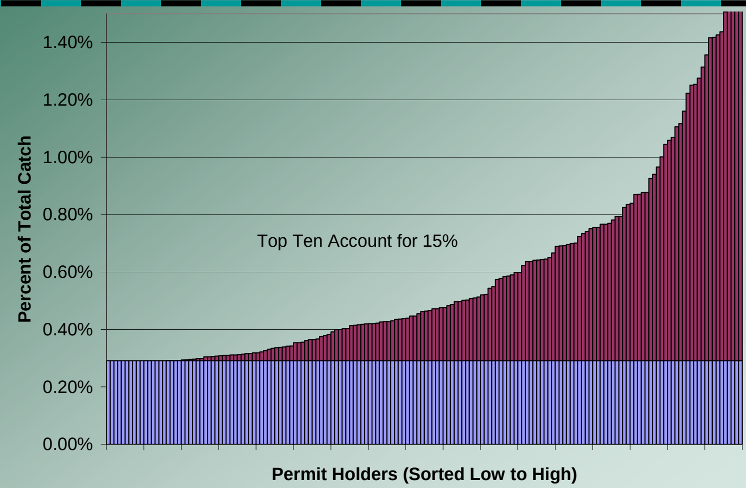
Initial Allocation of Harvest Shares for Catcher Vessels (See Page 26)

- **Catcher vessel permit owners will receive quota shares based on their permit history plus an equal division of the quota that could be attributed to permit history of bought-back permits (catcher-processors permit owners will not receive a portion of the quota shares distributed on an equal sharing basis)**
- **Suboptions for incidentally caught overfished species, either:**
  - (a) same as for OTHER FISH
  - (b) equally divide quota for incidentally caught overfished species

Initial Allocation of QS

- **The graphic below is an initial representation of the potential allocation of QS (shown on a percentage basis) based on Program A—pure catch history allocation, without the recent participation criteria or minimum landings criteria.**

Example Allocation for Petrale Sole



Accumulation Caps

- **Program A: 50% or No Limits**
- **Program B: Consider all limits (1%, 5%, 10%, 25%, or 50%, No limits)**
- **Program C: 1%, 5%, 10%, or 25%**

Whiting Sector Definitions

- **Discussed in Afternoon Session on April 19**
  - Participants indicated a general feeling that whiting would be consolidated to the CP sector if unconstrained by sector designations

Other Factors

- **Harvesting and Processing Costs**
- **Observer and Monitoring Costs**
- **Vessels and Processors with highest net revenue per fish are in the best position to purchase QS\QP**
- **Purchasing QS\QP will increase overall cost per fish and thus reduce net revenue per fish.**
- **Those that have to purchase less QS\QP to get back to pre-IFQ levels, have an advantage, compared to those that have to purchase more QS\QP to get back to pre-IFQ levels.**

Methods to Assess Consolidation

- Examine Initial Allocation
- Conduct key informant interviews
- Examine cost and revenue information
- Factor in accumulation limits
- Make an educated projection
- Bound projections with Scenarios

Consolidation Scenario 1

- ***Assume a moderate fleet consolidation*:**
  - In this scenario it would be assumed that QS are transferred and vessels drop out of the fishery such that the average vessel remaining in the industry fishes an average of 150 days per year. For this scenario, the average number of fishing days per vessel per year was chosen somewhat arbitrarily, and could be adjusted based on comments.
- **Is this scenario reasonable?**

Consolidation Scenario 2

- ***Assume a high fleet consolidation such that the average vessel fishes 270 days per year*:**
  - In this scenario it would be assumed that QS are transferred and vessels drop out of the fishery such that the average vessel remaining in the industry fishes an average of 270 days per year. This scenario was chosen based on the assumption that a single vessel is unlikely to be able to fish more than 300 days in a given year.
- **Is this scenario reasonable?**

Consolidation Scenario 3

- ***Assume a very quick transition to a moderately consolidated fleet*:**
  - In this scenario it is assumed that the fleet undergoes a "moderate" consolidation during the **first year** of the IFQ program—the average vessel fishes 150 days per year.
  - Theoretically, overall efficiency of the fleet—once it is consolidated—would not be affected by how quickly or gradually it consolidates. However, the impacts on communities and fishing crews are likely to be much more noticeable if the transition to a consolidated fleet is relatively quick.
- **Is this scenario reasonable?**

Consolidation Scenario 4

- ***Assume a gradual transition to a moderately consolidated fleet:***
  - In this scenario is assumed that the fleet undergoes a "moderate" consolidation over the **first five years** of the IFQ program —the average vessel fishes 150 days per year.
- **Is this scenario reasonable?**

Other Questions

- **What might be reasonable scenarios for consolidation of processors?**
- **Should other initial allocation options be included for CVs?**

Agenda Item F.3.c
Supplemental SSC Report
June 2006

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON TRAWL INDIVIDUAL QUOTA ANALYSIS – REVIEW OF STAGE I DOCUMENT

Jim Seger (PFMC) and Marcus Hartley (Northern Economics Inc.) briefed the Scientific and Statistical Committee (SSC) on the Stage 1 Draft – IFQs and Permit Stacking Alternatives in the Limited Entry Trawl Fishery (Agenda Item F.3.b, Attachment 1 and REVISED Attachment 1 ERRATA).

The SSC has several comments on the proposed methods:

- Analysis of the alternatives is a work in progress and a number of different data sources and approaches are being proposed. This analysis will generate a huge amount of output. To facilitate analysis and eventual consideration of results, it would help to narrow the scope of components and elements under each alternative. In addition, the SSC requests that the Consulting Team narrow the number of indicators being considered. Changes in the RCA boundaries and other aspects of management besides the current system of cumulative trip limits, were not considered, which seems inconsistent with the goal of the IFQ program to reduce bycatch.

- An objective of the IFQ program is to reduce bycatch and discard mortality. However, some elements for each alternative distinguish between low-OY and high-OY situations using thresholds, for example B25%, with quota shares becoming inactive if abundance is less than the threshold. In this case, management of the fishery would revert to cumulative trip limits, which raises a consistency issue. In other words, any benefits of the IFQ program for reducing bycatch would be forfeited for overfished stocks because the incentive for doing so would be lost. In any case, the SSC recommends basing the low-OY situation on whether the stock is considered overfished.

- Instead of basing significance of the effects from the alternatives on an arbitrary level (i.e. 20%), the SSC recommends reporting results in terms of the actual percentage change, or at least indicate the approximate level (20-30%, 30-40%, etc.).

- The Consulting Team suggests that an interview-based approach be used to obtain information from “key informants” to “quantify the likely changes under each alternative.” While this type of information is important for understanding the current structure of the fishery, the SSC is skeptical that such information can be used as a reliable basis for evaluating future changes under hypothetical conditions (i.e. different scenarios and alternatives).

- The Stage 1 Draft document provides an overview of five models (Initial Allocation, Industry Consolidation, Incidental Catch, Observer Cost, and Profitability) that would be developed for an analysis of the alternatives. However, descriptions of these models is rather general, and it was not possible for the SSC to evaluate the structure of these models at this time. Most of the SSC discussion focused on the Incidental Catch model. An important point is that modeling on a tow-by-tow basis may not be reliable and raises the question of how to handle relatively rare "disaster tows" that generate large amounts of bycatch. Regarding the Consolidation and Profitability models, the SSC recommends that effects on employment (e.g. crew shares) should be included as a main component of the analysis.

- The issue of dealing with changes in market power between harvesters and processors is important, and unsettled according to the Consulting Team. The SSC recommends reviewing current literature on this subject [e.g. Matulich, S., and M. Clark. 2003. North Pacific Halibut and Sablefish IFQ Policy Design: Quantifying the Impacts on Processors, Marine Resource Economics, 18(2), 149-166.].

- The SSC discussed potential problems in the initial allocation if healthy and overfished stocks are not treated differently. Specifically, past catch may work well for establishing the initial allocation of permits for healthy stocks. However, this type of allocation rule could create a perverse reward for vessels with the highest levels of catch for overfished species. An alternative is a uniform allocation of quota shares for these stocks.

Finally, the SSC wishes to highlight the complexity of the efficiency and equity trade-offs that are likely to occur under any IFQ program, and for the possibility of unforeseen consequences. The Consulting Team indicated that a range of estimates for potential efficiency gains (i.e. benefits), and costs of implementation, should be available to inform the Council after the analysis proposed in the Stage 1 Draft document is complete.

PFMC
06/13/06

GROUNDFISH TRAWL INDIVIDUAL QUOTA COMMITTEE REPORT ON TRAWL INDIVIDUAL QUOTA ANALYSIS REVIEW OF STAGE 1 DOCUMENT

The Trawl Individual Quota Committee (TIQC) met Sunday June 11, 2006 and reviewed the proposed restructuring of the management regime alternatives, the individual fishing quota (IFQ) program alternatives, and other areas where the Council staff sought additional guidance (Agenda Item F.3.a, Attachment 2; Staff Report, Issues for Council Consideration). The TIQC recommends the Council modify the specifications provided in the staff report as follows:

1. Restructuring IFQ Program Alternatives

With respect to the three program alternatives, change the section on initial allocation of quota shares to groups of initial participants to the following:

Program A	Program B	Program C
Initial Allocation of Quota Shares, Section B.1.0		
Eligible Groups: 50% to current permit owners; 50% to processors.	*Eligible Group Suboption B-1:* 100% to current permit owners. ~~*Eligible Group Suboption B-2:* Nonwhiting--100% to current permit owners. Whiting--50% to current permit owners; 50% to processors.~~ ~~*Eligible Group Suboption B-3:* 90% to current permit owners; 10% to processors.~~	***Eligible Groups:* 75% to current permit owners, 25% to processors.** **(NOTE: For the nonwhiting shoreside fishery only, up to 20% of the quota pounds will be held back from the allocation (off the top) to support the community stability holdback. Each year, the Council will have the flexibility to determine whether 20% or some lesser amount will be held back.**

2. Specification of Design Elements

For purposes of allocation of QS/QP (quota share/quota pounds), two types of processors are defined for any program which includes an initial allocation of quota share to processors. These definitions will apply only for the initial allocation and not for other purposes (unless otherwise specified):

1. At-sea processors are those vessels that operate as motherships in the at sea whiting fishery or those vessels permitted to operate as catcher-processors in the catcher-processor whiting fishery.
2. A shoreside processor is an operation, working on US soil, that takes delivery of trawl-caught groundfish that has not been "processed at-sea" and that has not been "processed shoreside"; and that thereafter engages that particular fish in "shoreside processing."

    a. "Shoreside Processing" is defined as any operation that takes place shoreside; and that involves:

1) cutting groundfish into smaller portions; OR
2) freezing, cooking, smoking, drying groundfish

and packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale market.

b. The purchase and redistribution into a wholesale market of live groundfish from a harvesting vessel is also defined as "shoreside processing."
c. Entities that received fish that have not undergone "at-sea processing" or "shoreside processing" (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a "processor" for purposes of QS/QP allocations.
d. The recipient of the groundfish listed on the fishticket is presumed to be the first processor unless evidence is presented to NMFS that some other entity was the processor as defined in this section.

For the at-sea fishery, observer data and weekly processing reports will be used to document landings. Item d. may potentially result in conflicting claims to the history for a particular landing (e.g. claims by the first receiver and a processing company to the history for same fish ticket). This will create a need for adjudication. Further criteria will need to be developed for use in adjudication.

3. Definition of a Whiting Trip

Two options exist for the definition of a whiting trip. Based on its review of scattergrams showing the pounds of whiting and percent of whiting for trips in 2002, 2003, and 2004, the TIQC recommends that any trip composed of more than 50% whiting be considered a shoreside whiting trip. The rejected alternative would have defined a whiting trip as those trips composed of more the 50% whiting or trips with more than 10,000 pounds of whiting. The TIQC rejected the 10,000 pound option out of concern that different type of IFQ might be required for whiting and nonwhiting trips. If a vessel went out intending to make a whiting trip covered with IFQ for the whiting fishery and the trip was cut short, such that 10,000 pounds was not taken, then the vessel might not have the right type of IFQ to cover the catch.

4. Bycatch in the Whiting Fishery under Alternative 2

The TIQC is concerned about how bycatch in the whiting fishery would be managed under Alternative 2 and would like to explore the possibility of creating co-ops for that alternative. The TIQC would like to address this issue in more detail and report back at the next meeting. It is the TIQC's understanding that taking another meeting to develop this specification will not delay the early part of Stage II of the analysis.

5. Provisions for a Rollover of Unused IFQ from One Whiting Sector to Another

The IFQ program includes the possible provision of a rollover of unused IFQ from one whiting sector to another. Additional detail needs to be developed for this alternative. The TIQC will take this up at its next meeting. Again, it is the TIQC's understanding that taking another meeting to develop this specification will not delay the early part of Stage II of the analysis.

PFMC - 6/13/06

PACIFIC MARINE CONSERVATION COUNCIL

Mr. Donald K. Hansen
Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

April 14, 2006

Re: Trawl Individual Fishing Quota analysis

Dear Chairman Hansen,

Thank you for the opportunity to comment on behalf of Pacific Marine Conservation Council (PMCC) on the preliminary analysis that might be used as the basis for developing a draft environmental impact statement for a proposed west coast groundfish dedicated access privilege program (DAP). PMCC is a nonprofit fisheries conservation group that includes commercial and sport fishermen, marine scientists, conservationists and community advocates.

PMCC is very concerned about the inadequacy of the range of alternatives currently under analysis, the basic features within the alternatives, and the failure of program developers to fully implement the DAP-related recommendations of the U.S. Commission on Ocean Policy (USCOP). We've expressed these concerns in scoping, in written comments and in oral testimony, and we'll attempt to avoid redundancy here.

We hope that these comments will be useful for those developing the west coast DAP analysis for the Pacific Fishery Management Council (PFMC), as well as useful to members of the PFMC as they direct changes to the content and approach of the analysis.

A suite of alternatives that represent an adequate range of possible actions should be adopted. Apparently this step still requires additional guidance from the PFMC.

Once the alternatives are clear, each alternative should be evaluated relative to each of the goals and objectives as adopted by the PFMC. This step is not adequately explicit in the draft analysis as of this date. PMCC also recommends a concurrent evaluation of each alternative for conformity with the recommendations of the USCOP. It is particularly important to the public interest whether or not substantial and measurable conservation benefits would result from alternatives, as measured against the future baseline.

We feel strongly that it is essential when developing management options for the groundfish fishery, especially new approaches such as DAPs, to assume that area management will need to play a role. We discuss this below in the context of the emerging science that describes spatial limits for sub-populations of some fishes, as well as in the interest of equity benefits of smaller management units. The trend toward area management is obvious and this analysis should acknowledge this reality both in terms of program features and in the description of future baseline conditions.

PO Box 59, Astoria, Oregon 97103 Tel: 503-325-8188 Fax: 503-325-3584 www.pmcc.org

Community impacts objective

As PMCC previously testified at the March 16, 2006, meeting of the Trawl Individual Quota Independent Experts Panel, a modification to Objective 7 (page 27 of the draft analysis) should be made to reflect guidance from the PFMC. This change is significant because it reflects the stronger intention of the PFMC to "Minimize adverse effects from an IFQ program on fishing communities."

On page 30 of the June 2005 PFMC minutes it is recorded:

"Mr. Anderson asked for a friendly amendment to Motion 19, that would modify the goals and objectives on page 2 of C.5.a, Attachment 1 as follows: change goal 1 to read "and attainment of fishery management objectives" and remove the words "to the extent practicable" under Objective 7. The motion was accepted as a friendly amendment."

Motion 19 later passed.

PMCC finds that the tools to mitigate adverse impacts to communities analyzed thus far are deficient to achieve that end. The most basic of tools that should be part of any IFQ program is a conservative and enforceable cap on consolidation of *control* of quota shares.

Additional tools that are reasonable to evaluate include spatial distribution of quota to protect community interests (as well as to avoid local depletion of sub-populations of fish), direct distribution of quota to communities, provisions that allow fishermen and groups representing any type of commercial or recreational effort to own quota, and establishment of stewardship areas prior to or concurrent with implementation of a DAP.

Alternatives Considered but Excluded from Detailed Analysis

PMCC is concerned about what we consider the premature rejection of alternatives and features of alternatives from detailed analysis. Some of these we consider to be within a reasonable range of alternatives that could accomplish the goals and objectives adopted by the PFMC.

We find it somewhat arbitrary to presume, as stated on page 55 of the draft analysis, that "Elements and options that are included in the Components Analysis will be assessed in a both a quantitative and qualitative manner that will include the justification for exclusion."

PMCC is interested, for example, in a full analysis of bycatch sector caps by gear type and geographic area, to provide a fair contrast of this approach with other alternatives. Such an approach has been anticipated as a bycatch reduction system as outlined in Amendment 18 of the Pacific Groundfish Fishery Management Plan.

We also agree with the PFMC that an alternative based on IFQs for overfished species should be included. Again, from page 30 of the June 2005 PFMC minutes:

Mr. Anderson moved (Amendment #4 to Motion 19) to add to the package for analysis recommendation C from the GMT report (IFQs for overfished species only). Mr. Mallet seconded…. Amendment #4 passed.

Consistency with Congressional action

Congress is taking up reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act, and there is a likelihood that such legislation will be passed this year. One bill, S.

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2021, has passed out of the Senate Commerce Committee. This bill includes basic standards that apply to Limited Access Privilege Programs (LAPP), such as this trawl IFQ. Two bills introduced in the House of Representatives, H.R. 5018 and H.R. 5051, include similar standards.

A stand-alone bill, the Fishing Quota Standards Act or H.R. 3278, has also been introduced in the House. The provisions in this bill closely track the recommendations of the USCOP and the PMCC positions regarding national standards for IFQs.

PMCC believes that it would be wise to craft the quota system alternatives so that they are consistent with standards under consideration by Congress. We realize that there has been discussion of an attempt to exempt this program from national standards designed to protect the environment and our fishing communities. Please consider however, the Congressional intent expressed in the report language which accompanies S. 2021:

> EFFECT ON CERTAIN EXISTING SHARES AND PROGRAMS- New section 303A(h) would ensure that section 303A would not require a reallocation of quota share from any limited access system, including sector allocations, submitted to the Secretary and approved by the Council prior to the date of enactment of this bill.
> However, the LAPP provisions of S. 2012 adopt the recommendations of the U.S. Ocean Commission, and the Committee expects that quota programs now being developed by the Councils will incorporate these recommendations even before enactment of this legislation. The Committee recognizes that Councils must move forward on programs under development and does not intend to cause unwarranted delays by requiring mature plans to be re-drafted wholesale. But Councils should attempt to ensure plans adhere to the spirit of the criteria recommended by the U.S. Ocean Commission and those contained in the bill in order to improve the consistency and fairness of future programs.

Area management in the future of the groundfish fishery

The way that west coast groundfish fisheries are managed is out of balance. The existing coast-wide management approach of West Coast groundfish does not protect the biological structure of fish populations, encourages local area depletion and provides disincentives for conservation-minded fishermen. As a result of this approach, high levels of bycatch in one geographic area can shut down fishing in other geographic areas.

Recent science (reviewed by Berkeley et. al. 2004) concludes that fish stocks may consist of "several reproductively isolated units, and that recruitment may come from only a small and different fraction of the spawning population each year." The authors go on to state that "the age structure of a stock combined with the spatial distribution of recruitment are as important as spawning biomass in maintaining long-term sustainable population levels. In particular, there is an increasing number of examples of complex population structure in species currently managed as a unit stock, and increasing evidence that only a small fraction of spawners in a stock – those that spawn at the right time and place – successfully contribute to each new cohort." None of this variation is currently accounted for in the management of West Coast groundfish populations. Recent modeling efforts also suggest that age structure can have a profound effect on recruitment variability in cod (Begg and Martiensdottier 2002) and sustainable harvest levels in rockfish (Spencer et al. *in press*).

Attempting to manage constraining overfished species on a coastwide basis is an ongoing challenge just in seeking fairness and equity between gear groups and regions. Add to this the evidence that local depletions may lead to stock fragmentations and it starts to become clear that the entire coast is likely too broad a scale for management of at least some species. And it could get worse. Tradable IFQ shares would likely encourage local depletion more than current management, and at the same time could further limit opportunities for fishing in areas where populations are abundant.

Solutions that move toward area management will likely appear at multiple scales in an adaptive process. Precautionary measures such as harvest guidelines by state have already been used, even without stock assessments that explicitly evaluate the relative strength of fish populations by region. Differential trip limits broken by capes or state lines have also been used.

A natural and practical way for this to progress is to cape-to-cape management, which would divide the west coast management unit into smaller areas delineated by Cape Flattery, Cape Blanco, Cape Mendocino, and Point Conception, well-known biogeographic boundaries in fish distributions. Beyond the biological benefits, a thoughtful approach to management on smaller scales could promote local stewardship and benefit communities as well.

It makes good sense to at a minimum provide for distribution of DAP quota shares on a geographic basis. The British Columbia groundfish trawl individual vessel quota program took such an approach, even in the absence of data identifying sub-populations of quota fish. Managers in British Columbia had the foresight to anticipate the disruption a future redistribution of quota by area would have on the fishery.

Even if spatial elements are not included within the DAP alternatives, which we believe would be a grave mistake, the practicality of area management cannot be ignored. First, the science is emerging that will likely necessitate management of some species at smaller geographic scales. Second, there is strong demand in some communities for area management, and for stewardship areas that could provide, among other benefits, local incentives for effective conservation. And, third, the problem of bycatch has not gone away just because a DAP is under consideration. Although Amendment 18 unacceptably lacks a time schedule for action to reduce bycatch, it does express the intent of the PFMC to institute bycatch caps by fishing sector, which could be subdivided geographically.

PMCC believes that all of these trends and expectations should be part of the analysis of future baseline conditions, both for the purpose of evaluating any incremental benefits of each DAP alternative, and for anticipating the management environment at the time when a DAP might be implemented.

Thank you for considering our comments.

Respectfully submitted,

Peter Huhtala
Senior Policy Director

References: *We cited some of these documents in our comments. All of them are incorporated into our comments by reference, because we believe that they each contribute to understanding facets of recent science regarding stock structure and spatial distribution of fish populations. We believe that awareness of this information should compel inclusion of spatial elements within many DAP alternatives, and it also provides insight into the scientific basis for a trend in west coast groundfish fisheries toward area management. Links to most of these documents can be found on the PMCC website at www.pmcc.org.*

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Chairman Don Hansen
Pacific Fishery Management Council
7700 NE Ambassador Place
Portland, OR 97220-1384

RECEIVED
MAY 03 2006
PFMC

Bernard Bjork
36293 Barrtoldus Loop
Astoria, OR 97103

May 02, 2006

Dear Chairman Hansen;

I am a retired fisherman of 30 years. For 21 of those years I fished in the Alaska Halibut and Black Cod fishery, 9 of those years under the IFQ system. Last year I was asked by local Astoria/Warrenton based groundfish drag fishermen to help them with certain aspects of their Individual Transferable Quota System. After looking into their plan I could see that it was a very good idea. Being able to transfer too much of a certain species to another vessel (on paper) during a given trip would eliminate most bycatch. Making it 100% observer covered would be a major change from the "Good Old Days".

Processor or community quotas are not the way to go. Senator Smith's Two Pie Hake Quota is definitely not the way to go. Making our fishermen into modern day sharecroppers under either processor or community quotas is not the American way. Keeping fishermen as independent as possible is the proper course. I was able to use the quota I received as collateral for two seperate loans. I used that money to refurbish my boat, and acquire more quota. That money made its way to local shipyards, engine dealers, electronic stores, gear stores, and quota brokerages. The days of the company store are over. Lets not go back to that.

Chairman Hansen, I want to thank you and the council members for all the time you give to your community. This time that you give back to your community is a choice that you make. Please allow our fishermen to be able to continue to make decisions and choices. They can do that much better under Private ownership of quota, not under processor or community quotas.

Sincerely;
Bernard Bjork
Bernard Bjork

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May 26, 2006

Mr. Donald K. Hansen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

RE: Agenda item F.3

Dear Chairman Hansen:

I attended the Trawl workshop in Portland on April 19th to find out how the Contractor intends to analyze the potential impacts of a trawl IQ plan on communities. The community session was held at the end of the workshop, many people had left, and the Contractor decided to change the format and give each person a chance to comment instead of breaking into working groups. I think it is important to note that what many people consider to be the most important issue—how the trawl IQ plan will negatively impact coastal communities and other fisheries—wasn't approached with the same process as the other issues. I believe it is critical that the PFMC not allow community impacts to be pushed aside or given token analysis. The following issues need to be analyzed by the Contractor before the Council moves forward with approving a trawl IQ plan:

--Community impacts: the Contractor proposed to limit analysis of impacts to communities to "trawl communities". **All coastal communities must be considered.** I can list a dozen negative impacts the trawl fishery and trawl management has had on my community, the non-trawl community of Port Orford, Oregon. One major impact is the groundfish harvest reductions brought on by destructive trawl gear that put the Port Orford longline fleet completely out of business. Another example is the influx of capital into the crab fishery from the trawl buyback that brought thousands of crab pots into an already over-capitalized fishery. There is a long list of negative impacts to my community over many years. I anticipate severe impacts to my community if the trawl IQ plan isn't designed with area-based IQs - where the fish was historically landed - the entire trawl IQ could end up being fished right here at Port Orford. Localized, serial depletion of fish stocks is a very real threat to our community.

--Loss of jobs in coastal communities: A major goal of IQs is to promote efficiency which translates to consolidation. Obviously many deckhands are going to lose jobs. I worked for the Oregon Groundfish Disaster Outreach Program and we had a tough time finding jobs in coastal communities for the displaced fishermen. Most people had to leave the coast and move to the I-5 corridor to find family wage jobs. It is devastating to coastal communities to lose working people, to lose families. The Council needs to acknowledge this issue and analyze it, and then decide if efficiency-a trawl IQ plan-is the best way to go.

--Impacts on other fisheries: IQs will make fishermen millionaires overnight. What will be the impact when IQ is sold and the fisherman invests the capital in other fisheries that have latent opportunity? That enormous influx of money into other fisheries will just shift the trawlers problems to other fisheries. For example, while the Oregon crab fishery is considered over-capitalized, at least 100 permits have landed less than 10,000 pounds in any one year of the 5 year window period for pot limits. That's a great deal of latent capacity available for the trawl IQ money.If Oregon does get a pot limit in place, highly efficient fishermen with lots of cash to reinvest buying latent permits, investing in the fastest boats and premium gear will severely impact the crab fishery. The same is true for west coast salmon. All fisheries have been negatively impacted by the trawl buyback money being poured into bigger, faster boats, more gear, purchasing latent permits. Do we need to destroy every fishery so the trawlers can "rationalize" their fishery?

--Impacts on other groundfish fishermen: The Council made a terrific mistake when you moved forward with a trawl only IQ program. The commercial longline fleet and sport and recreation fishermen are left with the unknown; we do not know what to expect for our fishery in the future. How do you intend to manage the other fishers? You should not move a trawl IQ program forward until you acknowledge what you are going to do about all the other groundfish fishermen. You have created incredible instability in the other groundfish sectors so the trawlers can get their IQ pushed through.

It is easy to understand why the trawlers want an IQ program. This is about making men millionaires. What is difficult for me to understand is what's in it for the PFMC that is the steward of the fish and the communities? What's in it for the country—this is a public resource?

Analyzing or scoping options for the IQ plan is important work for the Council to consider. The information generated from a thorough analysis of the impacts of a trawl IQ plan will provide critical guidance for the Council. Please spend the time and money needed to make sure you get the best possible information before you move the trawl IQ program forward.

Sincerely,

Leesa Cobb

Program Director

June 2, 2006

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland OR 97220

RE: June 16, 2006, Item F3 Trawl Individual Quota Analysis

Historically, the Central Coast harbors of California have sustained a vibrant trawl fleet whose year-round landings have provided the foundation for fishery-related businesses and harbor economic infrastructure. In recent years, seasonal/area closures, reduced quotas, and increased costs have caused severe stress on the participants in these fisheries and on related businesses, eventually impacting the harbors' ability to provide marine related services such as fuel, ice, chandleries and buyers. This is especially true in the California harbors that have only sporadic landings in other fisheries such albacore, salmon and crab. These harbors and their marine related businesses are dependent on ground fish landings. We now understand that the PFMC is considering a major change in fishery governance and regulations in ground fish with the issues surrounding individual fishing quotas for trawlers.

Small, fishing-dependent harbors, have concerns about IFQs to insure that such a governance change does not further diminish our local businesses' capacity to support harbor infrastructure and our fishing fleets. Earlier this year with the much appreciated support of the PFMC and its staff, the Fishing Heritage Group (FHG), hosted an IFQ workshop in Morro Bay, California to try to evaluate our situation in the context of your current IFQ considerations and attempt to formulate input to the PFMC.

We are concerned that a change to IFQs, without appropriate safeguards, could result in consolidation of buyers and fishing operations into a few harbors on the West Coast. This inevitably will collapse the many small, fishing-dependent harbors that have relied on ground fish for year-round employment and services support. Once traditional fishing uses are eliminated in a coastal community they do not come back, representing a real and permanent loss to the nation's seafood supply, economy, and missed opportunities in promoting sustainable fisheries with improved gear under the umbrella of ecosystem based management.

We encourage you to move carefully in your development of IFQ alternatives and deliberately try to protect existing fragile fishing businesses and small fishing-dependent harbors. Concepts we support and recommend for further thorough analyses are:

1) A Community stabilization holdback allocation or some other mechanism to insure broad participation in fisheries and protect the local economic and cultural values of small fishing-dependent communities on the Central Coast.
2) Consolidation caps or some other mechanism to avoid consolidation of fishing efforts and businesses into a few harbors and a few corporate owners.
3) Provisions that would allow gear switching between gear sectors, in a measured way that will not injure existing participants.
4) Development of an IFQ allocation formula based on years in the fishery, contribution to fishing dependent communities and conservation performance as well as catch history.
5) Stewardship area management that will improve regional management already in place, encourage conservation practices, and take advantage of price and seasonal market opportunities while accessing regionally plentiful fish stocks.
6) Current work effort on community profiles for West Coast fisheries. Collection of this baseline information should be expedited and highlighted. It will be vital to decision

making in the IFQ process to insure that we understand the value and importance of these communities along with the potential impacts of major governance changes.

Concurrently with ongoing analysis of IFQs as a management tool, we ask that the Council support and approve Experimental Fishing Permits (EFPs) that will help to develop bycatch reduction methods and incentives, environmentally friendly gear types and access to those plentiful stocks in the RCA or other under harvested resources that may provide the platform for gear switching programs.

We are a unique voice, representing some environmental protection groups, fishermen and Central Coast communities/harbor managers that provide a forum for the resolution of conflicts associated with a variety of fishery management issues. Trust is being built with the FHG and its diverse stakeholders on developing constructive approaches to the issues that face us, unified by the desire to maintain sustainable fishing businesses, while protecting our ocean environment into the future. We hope we can be a powerful partner with the PFMC as we work together to accomplish mutual goals. We stand ready to assist the PFMC in working through the complex issues associated with ground fish trawl IFQ programs, especially as it affects fisheries and communities of the Central Coast of California. Thank you for your consideration.

On behalf of the Fishing Heritage Group -

Brian Foss – Santa Cruz Port District Director
Jay Elder – Harbor Manager, Port San Luis
Rick Algert – Harbormaster, City of Morro Bay
Jeremiah O'Brien – Morro Bay Commercial Fisherman's Organization
Chris Kubiak – Independent fishery consultant, fisherman
Rod Fujita – Senior Scientist, Environmental Defense
Chuck Cook – Director, Coastal and Marine Program, The Nature Conservancy

FISHING HERITAGE GROUP MEMBERSHIP

Harbors:
Linda McIntyre, Moss Landing; Steve Scheiblauer, Monterey; Rick Algert, Morro Bay; Jay Elder, Port San Luis Harbor; Peter Grenell, Half Moon Bay; Brian Foss, Santa Cruz

Fishermen:
Kathy Fosmark and Mike Ricketts, Alliance of Communities for Sustainable Fisheries; Jeremiah O'Brien, Morro Bay Commercial Fishermen's Organization

Nongovernmental Organizations:
Chuck Cook, The Nature Conservancy; Rod Fujita, Environmental Defense; Mike Sutton, Center for the Future of Oceans, Monterey Bay Aquarium

Observer/Advisors:
Greg Haas – District Representative for Congresswoman Lois Capps

cc: The Fishing Heritage Group

NRDC
THE EARTH'S BEST DEFENSE

NATURAL RESOURCES DEFENSE COUNCIL

June 6, 2006

Agenda Item F.3
June 2006

Dr. Donald McIsaac, Executive Director
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, OR 97220-1384

Dear Dr. McIsaac and members of the Council:

On behalf of the Natural Resources Defense Council (NRDC) and our more than one million members and activists, we are writing to offer our comments on the Groundfish Trawl Individual Quota Stage I Analysis.

NRDC has a long-standing interest in the conservation of the Pacific groundfish fishery. While IFQs are an economic tool, they can be used to achieve conservation goals. If the Council determines that an IFQ system is necessary and appropriate for this fishery, the program should be done in a way that maximizes the conservation of groundfish populations and the protection of critical habitats and minimizes bycatch. After reviewing the Stage I analysis, we are concerned that many conservation tools are absent or appear to have been discarded without proper analysis. We ask that the analysis be revised to address the following concerns.

1. **Legal properties of quota.** We recommend that the Council adopt explicit language as part of any IFQ program clarifying that quota shares are privileges that can be revoked by NMFS or the Council. We suggest the following language, from S. 2012, stating that IFQs under this program:
   - shall be considered a permit for purposes of sections 307, 308, and 309 of the Magnuson-Stevens Fishery Conservation and Management Act;
   - may be revoked, limited, or modified at any time in accordance with the Act, including revocation for failure to comply with the terms of the plan or if the system is found to have jeopardized the sustainability of fish populations or safety of fishermen;
   - shall not confer any right of compensation to the holder if the privilege is revoked, limited or modified;
   - shall not create, or be construed to create, any right, title, or interest in or to any fish before the fish is harvested by the holder; and
   - shall be considered a grant of permission to the holder to engage in activities permitted by such limited access privilege.

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2. **Gear switching.** If the only way to get, use, and hold quota is to trawl then trawl gear will continue to be a major part of the groundfish fishery. The bycatch and habitat impacts of a permanent trawl fishery—even with the Councils' EFH provisions—are likely to be much greater than that of a fishery that includes a higher ratio of fixed gear to trawl effort. The Council should include a program allowing quota holders to convert from trawl gear to other gears without losing their quota or landings history. Analysis of such an option could help identify measures that might be needed to avoid potential adverse impacts on other gear groups. For example, conversions could be limited to a certain amount of quota or vessels each year and linked to an analysis demonstrating the possible impacts of increased effort in areas open to fixed gear. We understand that Chris Kubiak and Rod Fujita have submitted a gear-switching proposal to the Allocation Committee, and we believe gear-switching should be explicitly addressed in the IFQ process.

3. **Initial allocation.** The analysis focuses primarily on using catch history and recent participation to award initial shares. NRDC strongly disagrees with this approach. One of the premises of an IFQ system is that they are a market-based approach to allocating fish, and yet Section 1.2.1 of the analysis indicates that market-based approaches to initial allocation, such as auctions, will not be considered. An allocation system based solely on past performance places the Council in the extremely difficult position of picking winners and losers, and invariably leads to extensive analyses of multiple allocation schemes as everyone strives to be in the winners circle. We believe it could be much more effective to structure a tiered auction, including categories for different size vessels and a cap on consolidation. This also has the benefit of returning more of the real value of the public resource to the public trust and providing start-up management funds. Tiered lotteries can provide many of the same benefits without forcing the Council to reward or punish individual fishermen. We ask the Council to reconsider auctions and lotteries in initial allocation.

   At a minimum, catch history and recent participation should be part of a multi-factor allocation system that also includes conservation criteria, such as a vessel's history of low bycatch rates.

4. **Hard bycatch caps**. Because of the multi-species nature of the groundfish fishery, it includes several overfished species as well as species whose market value has changed dramatically over time. NRDC supports hard bycatch caps for overfished species, as well as measures designed to keep the total mortality of every managed species within its OY, and measures that will systematically reduce the bycatch of species without OYs over time (e.g. a bycatch cap with annual reduction targets until a minimum level is reached). NRDC does not support rollover of quota for overfished species.

5. **Processor quotas.** NRDC is opposed to a separate system of processor shares and we support the Council's current decision to forgo such a system and only focus on quotas for catching fish.

Designing and implementing an IFQ program is a complex process and we appreciate the Council's work in keeping its process accessible and open to the public. We look forward to continuing to work with the Council and staff on groundfish management.

Sincerely,

Karen Garrison

Kate Wing

CONSIDERATION OF INSEASON ADJUSTMENTS

The Council set optimum yield (OY) levels and various management measures for the 2006 groundfish management season with the understanding these management measures will likely need to be adjusted periodically through the biennial management period with the goal of attaining, but not exceeding, the OYs. The Groundfish Management Team (GMT) will begin meeting on Sunday, June 11, 2006 and the Groundfish Advisory Subpanel (GAP) will begin meeting on Monday June 12, 2006 (see Ancillary A and C agendas) to discuss and recommend inseason adjustments to ongoing 2006 groundfish fisheries.

Under this agenda item, the Council is to consider advisory body advice and public comment on the status of ongoing fisheries and recommended inseason adjustments prior to adopting final changes as necessary.

Council Action:

1. **Consider information on the status of ongoing fisheries.**
2. **Consider and adopt inseason adjustments as necessary.**

Reference Materials:

1. Agenda Item F.4.c, CDFG Report: Draft California Department of Fish and Game Report on Inseason Management Proposals for the 2006 California Recreational Fishing Season.
2. Agenda Item F.4.e, Public Comment.

Agenda Order:

a. Agenda Item Overview — John DeVore
b. Report of the Groundfish Management Team (GMT) — Susan Ashcraft
c. Agency and Tribal Comments
d. Reports and Comments of Advisory Bodies
e. Public Comment
f. **Council Action**: Adopt Final Recommendations for Adjustments to 2006 Fisheries

PFMC
05/23/06

DRAFT CALIFORNIA DEPARTMENT OF FISH AND GAME REPORT ON INSEASON MANAGEMENT PROPOSALS FOR THE 2006 CALIFORNIA RECREATIONAL FISHING SEASON

BACKGROUND AND PROPOSED ACTION

The Pacific Fisheries Management Council (Council) approved inseason changes to California's recreational 2005 season and depth structure at its March 2005 meeting. The Council, in adopting these changes, took into account a number of factors including: 1) the 2004 annual California Recreational Fisheries Survey (CRFS) estimates of recreational take which showed that harvest of overfished species was below their respective California recreational harvest targets in 2004; and 2) the improved ability for real-time inseason catch monitoring through the new CRFS program. The March 2005 inseason changes provided more recreational fishing opportunity while keeping projected impacts (derived from California's recreational catch model) within recreational harvest guidelines or allocations for overfished and constraining species.

In March 2006, complete CRFS estimates of recreational take for 2005 (through December) became available. These estimates indicated that even under this modified management structure adopted at the March 2005 meeting, the California recreational harvest guidelines or allocations for overfished species were not exceeded and, in some cases, catch was well below the projected impacts. However, due to the shallow water restriction of 20 fm in some areas, fishing pressure was increased on nearshore groundfish species resulting in take that met or exceeded these species OYs or harvest targets. These results suggest that the current 2006 management structure could be further modified to allow for additional fishing opportunities for shelf species such as vermilion rockfish (thereby reducing fishing pressure on nearshore groundfish species such as the nearshore rockfish and cabezon), while still remaining within recreational harvest targets for overfished and constraining species.

A proposed season and depth structure for the California recreational fishery is provided in Attachment 1. We request that the Council consider adopting at the June 2006 PFMC meeting these inseason management measures in federal waters for 2006.

A table with the impacts of this proposed inseason change is provided below. These impacts were projected using a modeling approach that has been reviewed and approved by the Groundfish Management Team for use in crafting 2007-2008 recreational fishery management options.

Prepared by: Debbie Aseltine-Neilson, Susan Ashcraft, Deb Wilson-Vandenberg, and Kirk Lynn

ESTIMATED IMPACTS RESULTING FROM ACTION:

Species		2005 CRFS Catch Estimates	Projected 2006 Catch Estimates Under Current Regulations	Projected 2006 Catch Estimates Under Proposed Changes	HG[1], updated impact estimate[2], or HT[3]
Rebuilding Species	Bocaccio	38	52	66	66[2]
	Canary	2.3	6.2	7.9	9.3[1]
	Cowcod	0.1	0.2	0.3	0.4[3]
	Darkblotched	0	0	0	0[2]
	Lingcod	300	256	228	422[1]
	POP	0	0	0	0[2]
	Widow	1.7	5.7	17.6	17.6[2]
	Yelloweye	1.7	1.5	1.3	3.7[1]
Other Target Species	Black RF	180	176	142	171[3]
	Minor NS RF North (40˚10' – CA/OR)	19.9	17.3	15.3	15.3[2]
	Minor NS RF South (40˚10' – US/Mexico)	430	447[5]	436[5,6]	383[3]
	Cabezon	41.8	43.0	33.5[6]	42.1[4]
	Greenlings	4.8	6.7	5.5	15.5[4]

1 – Harvest Guideline (HG) established in Federal Regulations
2 – Best estimate of recreational impact in 2006
3 – Harvest Target (HT): For black rockfish, this is the state-derived recreational harvest target within the Federal HG for CA recreational and commercial catch, combined. The black rockfish recreational target is derived from CA Fish and Game Commission allocation guidance between recreational and commercial sectors.
4 – Total Allowable Catch (TAC) established in State Regulations.
5 – Includes increased take of California scorpionfish projected under California regulations which now couples fishing for California scorpionfish with fishing for nearshore rockfish, resulting in the same seasons and depths for both.
6 – These species show a reduction in projected take under the proposed inseason change primarily because the projection model does not include an increase in catch due to an inshore shift in effort when fishing is at or greater than 40 fm.

Attachment 1. Proposed California Recreational Inseason Action for June 2006 PFMC Meeting.

NORTH COAST
(CA/OR Border to 40 ° 10' N Lat)

North Coast 2005 and 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					30	30	30	30	30	30	30	30
Black rockfish[2]					30	30	30	30	30	30	30	30
Cabezon, greenlings, CA sheephead, ocean whitefish					30	30	30	30	30	30	30	30
Lingcod					30	30	30	30	30	30	30	

North Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					30	30	40	40	40	40	40	40
Black rockfish[2]					30	30	40	40	40	40	40	40
Cabezon, greenlings, CA sheephead, ocean whitefish					30	30	40	40	40	40	40	40
Lingcod					30	30	40	40	40	40	40	

NORTH-CENTRAL COAST
40 ° 10' N lat to Lopez Point (36 ° 00' N lat)

North-Central Coast 2005 and 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish							20	20	20	20	20	20
California scorpionfish							20	20	20	20	20	20
Cabezon, greenlings, CA sheephead, ocean whitefish							20	20	20	20	20	20
Lingcod							20	20	20	20	20	
Sanddabs												

North-Central Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish							40	40	40	40	40	40
California scorpionfish							40	40	40	40	40	40
Cabezon, greenlings, CA sheephead, ocean whitefish							40	40	40	40	40	40
Lingcod							40	40	40	40	40	
Sanddabs												

SOUTH-CENTRAL COAST
Lopez Point (36 ° 00' N lat) to Pt. Conception (34 ° 27' N lat)

South-Central Coast 2005 and 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					40	40	40	40	40			
California scorpionfish					40	40	40	40	40			
Cabezon, greenlings, CA sheephead, ocean whitefish					40	40	40	40	40			

Lingcod					40	40	40	40	40			
Sanddabs												

South-Central Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					40	40	40	40	40	40		
California scorpionfish					40	40	40	40	40	40		
Cabezon, greenlings, CA sheephead, ocean whitefish					40	40	40	40	40	40		
Lingcod					40	40	40	40	40	40		
Sanddabs												

SOUTH COAST

Pt. Conception (34 ° 27' N lat) to US/Mexico Border

South Coast 2005

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish			30-60	60	60	60	60	60	30	30	60	60
California scorpionfish										30	60	60
Cabezon, greenlings, CA sheephead, ocean whitefish			30-60	60	60	60	60	60	30	30	60	60
Lingcod				60	60	60	60	60	30	30	60	
Sanddabs												

South Coast 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish			60	60	60	60	60	60	30	30	60	60
California scorpionfish										30	60	60
Cabezon, greenlings, CA sheephead, ocean whitefish			60	60	60	60	60	60	30	30	60	60
Lingcod				60	60	60	60	60	30	30	60	
Sanddabs												

South Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish			60	60	60	60	60	60	60	60	60	60
California scorpionfish			60	60	60	60	60	60		60	60	60
Cabezon, greenlings, CA sheephead, ocean whitefish			60	60	60	60	60	60	60	60	60	60
Lingcod				60	60	60	60	60	60	60	60	
Sanddabs												

Agenda Item F.4.e
Public Comment
June 2006

Dear Don,

I have fished for over 35 years and own a part in a crab processing cannery. This is the oldest continuously operating cannery on the Col. River. In the last year we began purchasing black cod, I have been out on the open access part with one of my sons. We have a $1500 electronic scale on the boat — we weigh one garbage can at a time — as the boat rolls — 99 — 102 — 101 — 99 — 100 — and so on — looks like a 100 ~~lbs~~ — dump them into the slush ice — do it again — 10 times = 1000 lbs — everyone usually has some extra to throw over — hopefully theyre alive. Any way we get to the cannery — up the hoist — And the weight is 1011 ~~lbs~~ — now what — was it slush ice theyre suspended in — taking on a little water — or the almost impossible chance to hit 100 each time?

Some guys draw a line around the garbage can, also one around the tote — but again a guess — if they are smaller they pack more and your over a little.

Believe me were trying to be honest — we're facing this delima at our cannery right now.

How can we improve this program?

I know you guys are on the enforcement review at your next meeting — so let me try some thoughts from the fishermen and cannery

(2)

point of view — What if you created a realitively small range of overages – lets say 5% – 6% — or 50 Lbs. – something not very large – just enough to help make it possible to be close. There shouldn't be any incentive for the fisher to go over, — so buyer would make out a state ticket and send the overage check to the state or Nat. Mar. fish –

Then the next part for no incentive is the obvious fact that what ever the overages add up to would come off the final bio mass that is allocated to the open access. You would get a pretty good picture of how the small overages add up — by mid season you would have a pretty good scientific picture of what the final adjustment would be — As you put a couple of years into this method I believe you would have a good picture how it works –

It is very hard to "hit" the number – and most fishermen don't want to throw them back — esp. at the cost of fuel — I would hope you wouldn't just drop the weekely level by 50 Lbs. for every delivery, because I believe in most cases guys will get pretty close either just below or a little above. With negative incentives – Pay the state (no wants to do that) and the adjusted loss from the total! Please think about this – only trying to keep us legal —

Sincerely – Steve Gray – 360 642-2408 —

Agenda Item F.4.b
Supplemental GMT Report
June 2006

THE GROUNDFISH MANAGEMENT TEAM (GMT) REPORT ON CONSIDERATION OF INSEASON ADJUSTMENTS

The GMT reviewed several inseason management issues and have the following recommendations for consideration by the Council.

COMMERCIAL

Darkblotched Rockfish Bycatch Limits For The Whiting Fishery

In the non-tribal sectors of the whiting fishery, overfished species bycatch limits are currently in place for canary (4.7 mt) and widow rockfish (200 mt). Prior to the start of the 2006 whiting season, the projected catch of darkblotched rockfish by the non-tribal sectors was 16.2 mt. Although the Council considered a bycatch limit for darkblotched rockfish at its March and April meetings, a limit was not adopted.

At the Council's April meeting, in response to the Council request to examine a darkblotched rockfish bycatch limit, the GMT identified the need for whiting vessels to have flexibility to change fishing locations to avoid Chinook salmon, canary and widow rockfish; recognized that darkblotched rockfish encounters could increase if the fishery chose to operate in deeper waters to avoid Chinook salmon or overfished shelf species; recognized that the increased abundance of darkblotched rockfish as it nears the rebuilt stock level could also result in an increased bycatch rate for darkblotched rockfish; and, highlighted the past success of the whiting fishery to modify their fishing behavior to avoid all species of concern. Therefore, the GMT did not recommend a specific darkblotched rockfish bycatch limit to the Council.

Since the start of the 2006 primary whiting season, higher than anticipated darkblotched rockfish catch has occurred in the shore-based and at-sea fisheries. In addition, higher than anticipated darkblotched bycatch has occurred in the bottom trawl fishery. Data available on June 9, 2006, indicates that 30 mt of darkblotched rockfish could be taken by the non-tribal whiting sectors if the current catch rates continue throughout the season. The GMT believes that a 25 mt darkblotched rockfish bycatch limit for the non-tribal commercial sectors would reduce the likelihood of the darkblotched rockfish OY being exceeded, and reduce the risk of the whiting fishery affecting the continuance of other groundfish fisheries that encounter darkblotched rockfish. If the Council imposes substantial restrictions to the bottom trawl fishery to reduce darkblotched rockfish catch, there is still a substantial risk that the darkblotched rockfish OY may still be exceeded if the current darkblotched bycatch rate in the whiting fishery continues without a bycatch limit. It is important to recognize that proposing 25 mt cap for darkblotched rockfish in the whiting fishery is not equivalent to a bycatch allocation. There would be no guarantee that the whiting fishery would have the full 25 mt available to achieve the whiting OY. However, the GMT recognized that there is limited ability to detect and respond inseason to darkblotched rockfish harvest targets being exceeded in the non-whiting fisheries this summer, such that the whiting fishery could be restricted to prevent the darkblotched rockfish OY from being exceeded.

Darkblotched Rockfish Catch In The Limited Entry Bottom Trawl Fishery

Higher than expected darkblotched rockfish catch early in the year is projected to result in the darkblotched rockfish OY being exceeded by late summer unless the bottom trawl fishery north of 38° N. lat. is constrained. Darkblotched rockfish catch is approximately 40-50% higher than what was projected at the start of the fishing year. Preseason projections in January 2006 had indicated that 80-90 mt of darkblotched rockfish would be taken by the end of June. However, current data indicates that 122 mt will be taken by the end of June 2006. If measures are not taken to constrain the bottom trawl fishery, the groundfish fishery as a whole (including the whiting fishery) is projected to take 284.1 mt of darkblotched rockfish through the end of the year, exceeding the 200 mt OY. Approximately 20 to 30 mt are needed for the period 6 petrale fishery to occur. With an OY of 200 mt and a projected catch of 122 mt through the end of June, the catch of darkblotched rockfish needs to be minimized from July 1 through the end of October for the period 6 petrale fishery to occur.

To slow the catch of darkblotched rockfish in the bottom trawl fishery, the GMT considered options for increasing the size of the RCA north of 38° N. lat. for July through December, reducing cumulative limits for slope rockfish and species that co-occur with darkblotched rockfish, and reducing limits in areas where fishing effort shifts could result in high catch of other overfished species. The GMT considered changes to RCA boundaries and cumulative limits and would like to forward three options to the Council for consideration

OPTION B.1: Beginning on July 1, move the seaward boundary of the RCA north of 38° N. lat. out to 250 fm from July through the end of the fishing year (with petrale sole modifications for the November-December period); and move the shoreward boundary of the RCA north of 40° 10' N. lat from 100 fm to 75 fm for the July–August cumulative period.

OPTION B.2: Beginning on July 1, move the seaward boundary of the RCA north of 40° 10' N. lat. out to 250 fm from July through the end of the fishing year (with petrale sole modifications for the November-December period); and move the shoreward boundary of the RCA north of 40° 10' N. lat from 100 fm to 75 fm for the July–August cumulative period. Beginning July 1, move the seaward boundary of the RCA between 38° N. lat and 40° 10' N. lat to 200 fm until the end of August, and move the seaward boundary of the RCA between 38° N. lat and 40° 10' N. lat to 250 fm from September 1 to the end of the year (with petrale sole modifications for the November-December period).

OPTION B.3: Beginning on July 1, move the seaward boundary of the RCA north of 40° 10' N. lat. out to 250 fm from July through the end of the fishing year (with petrale sole modifications for the November-December period); Beginning July 1, move the seaward boundary of the RCA between 38° N. lat and 40° 10' N. lat to 200 fm until the end of August, and move the seaward boundary of the RCA between 38° N. lat and 40° 10' N. to 250 fm from September 1 to the end of the year (with petrale sole modifications for the November-December period).

In addition to RCA changes under either Option B.1 and B.2 the following trip limit changes would be made:

- reduce the “minor slope & darkblotched rockfish” trawl limits (large footrope, small footrope, and selective flatfish trawl) north of 40° 10’ N. lat. to 1,000 lb per 2 months.

- reduce the “minor slope & darkblotched rockfish” trawl limit between of 40° 10’ N. lat and 38° N. lat. to 1,000 lb per 2 months.

- reduce the splitnose rockfish trawl limit between of 40° 10’ N. lat and 38° N. lat. to 1,000 lb per 2 months.

- reduce selective flatfish trawl limits north of 40° 10’ N. lat. for Dover sole to 20,000 lb per 2 months, Other Flatfish to 40,000 lb per 2 months, petrale sole to 18,000 lb per 2 months, and arrowtooth flounder to 40,000 lb per 2 months.

- increase the shortspine thornyhead limit for large and small footrope gear north of 40° 10’ N. lat and between of 40° 10’ N. lat and 38° N. lat to 7,500 lb per 2 months.

- reduce sablefish limts for selective flatfish trawl north of 40° 10’ N. lat for the July-August period to 7,000 lb per 2 months.

Under option B.3, trip limit adjustments would be the same as option B.2, but shoreward limits north of 40 degrees 10 minutes N latitude would remain as currently scheduled in federal regulations.

Each option can be differentiated by the amount of risk they pose to the darkblotched rockfish stock and the probability that a period 6 petrale fishery can be accommodated. Option B.1 reduces darkblotched rockfish catch more than Option B.2, but Option B.1 eliminates much of the period 4 fishing opportunity for trawl vessels that home port in Fort Bragg. Option B.3 is the same as B.2 for slope opportunities.

Measures proposed under Option B.1. are expected to result in 162.0 mt of darkblotched rockfish being caught through the end of the year for the non-whiting portions of the groundfish fishery, as compared to 165.6 mt of darkblotched rockfish that are projected to be taken under Option B.2 and Option B.3.

In addition to increasing the size of the RCAs, the GMT recommends reducing trip limits for slope rockfish. Reducing the slope rockfish limits is intended to eliminate any incentive to target slope rockfish species and to make reductions in darkblotched rockfish a bit more certain. The “shoulder” of slope rockfish distribution is about 250 fm, with fishable concentrations at these depths. Even though we assume slope species are sparse seaward of the 250 fm contour, some boats are currently targeting the slope limits now and may continue to do so even with a 250 fm line. Reducing the slope limit to 1,000 lb per 2 months is expected to eliminate the incentive to target slope rockfish and ensure an opportunity for a period 6 petrale sole fishery.

Generally, the GMT supports transitional slope rockfish management measures in the area between of 40° 10’ N. lat and 38° N. lat. (darkblotched rockfish abundance rapidly declines in the area yet are frequently encountered.) Inseason data for 2006 shows that darkblotched rockfish landings off California are approximately 6.7 mt south of 40° 10’ N. lat and approximately 8 mt north of 40° 10’ N. lat to the CA/OR border. Data provided by CDFG for the area between 40° 10’ N. lat and 38° N. lat indicate that in 2005, 79% of darkblotched rockfish came from shallower than 200 fm, while the remaining amount came from 200-250 fm (none deeper than 250 fm). However, over a longer period of time data indicated that 9% of the darkblotched rockfish catch was from waters deeper than 250 fm, approximately 20% was from 200-250 fm and approximately 70% was from waters shallower than 200 fm. Because of the clear need to reduce darkblotched rockfish catch to as low as possible the GMT recommends that the slope rockfish limit reductions also be applied to the area between 40° 10’ N. lat and 38° N. lat.

Moving the seaward line of the RCA to deeper depths is predicted to result in an increase in trawl fishing effort in the areas shoreward of the RCA. Canary impacts decline as the shoreward boundary of the RCA is shifted from 100 to 75 to 60 fathoms respectively. Because of concerns that the catch of canary rockfish could increase over current projections, Options B.1 and B.2 include cumulative limit reductions for Dover sole, Other Flatfish, petrale sole, and arrowtooth flounder. These reductions are projected to keep the projected impacts within the 8.0 mt canary level specified by the Council for the limited entry non-whiting trawl fisheries. Sablefish reductions during period 4 are proposed to minimize the effort shift into the shoreward areas.

The Council’s previous consideration of a shoreward trawl RCA boundary of either 60 or 50 fm generated a number of concerns from state management agencies, the coastal tribes and coastal fishers. Among these concerns are Dungeness crab impacts, particularly during the summer molting period when trawl mortality of soft-shelled molting crab is likely high. Additionally, the nearshore area is a nursery ground for juvenile flatfish and other groundfish species; concentrating trawl effort in this area could increase mortalities on juvenile and unmarketable fish, or even increase the risk of localized depletions. Additionally, fishers have repeatedly stated that the viability of the trawl fishery is markedly reduced as it is increasingly constrained to shallower areas. These factors should be considered in evaluating placement of the nearshore trawl RCA line.

Because the DTS fishery is projected to shift into deeper waters to protect darkblotched rockfish, raising the shortspine thornyhead limit is expected to reduce regulatory discards while keeping the total catch of shortspine thornyhead within the 1,011 mt commercial shortspine HG.

The GMT understands that the GAP preferred option is option B.3. for the bottom trawl fishery. This option keeps selective flatfish trawl limits and shoreward RCA boundaries north of 40 degrees 10 minutes N latitude as planned, pushes the seaward boundary of the RCA to 250 fm, and closes the shelf portion of the bottom trawl fishery when the fleet reaches 8.0 mt of canary rockfish. Under this scenario, the GMT estimates that 8.0 mt of canary is projected to be caught by September 30, which is after the September Council meeting and would allow the Council to take action in time to close the shelf portion of the fishery by October 1.

Trawl representatives have indicated that the limits proposed in option B.1 and B.2 are too low to justify fishing and would create substantial discard. However, processors have indicated that the risk of closing the shelf fishery in October poses an economic risk to markets for flatfish species. This has the potential to interrupt market flow, and if this occurs, this creates a scenario where existing markets may be lost.

The GMT recommends that, if the Council elects to continue with currently scheduled regulations for shoreward trawl opportunities north of 40 degrees 10 minutes N lat, that this be accommodated with an inseason trigger for NMFS to take action outside of the Council meeting, and that this action would be implemented on September 1.

Limits Currently in Regulation

		RCA Boundaries		Two Month Limits							
Subarea	Period	Inline	Outline	Sablefish	Longspine	Shortspine	Dover	Other Flat	Petrale	Arrowtooth	Slope Rock
North 40 10	1	75	200*	14,000	15,000	4,000	50,000	110,000	60,000	100,000	4,000
Large	2	75	200	14,000	15,000	4,000	50,000	110,000	30,000	100,000	4,000
Footrope	3	75	200	20,000	23,000	5,800	35,000	110,000	30,000	100,000	4,000
Limit	4	100	200	20,000	23,000	5,800	35,000	110,000	30,000	100,000	4,000
	5	75	200	20,000	23,000	5,800	35,000	110,000	30,000	100,000	4,000
	6	75	200*	14,000	15,000	4,000	35,000	110,000	60,000	100,000	4,000
North 40 10	1	75	200*	5,000	3,000	3,000	20,000	90,000	25,000	80,000	4,000
Select	2	75	200	7,000	3,000	3,000	28,000	90,000	25,000	80,000	4,000
Flatfish Twl	3	75	200	13,500	3,000	3,000	28,000	90,000	28,000	80,000	4,000
Limit	4	100	200	13,500	3,000	3,000	28,000	90,000	28,000	80,000	4,000
	5	75	200	7,000	3,000	3,000	28,000	90,000	28,000	80,000	4,000
	6	75	200*	5,000	3,000	3,000	20,000	90,000	25,000	80,000	4,000
38 - 40 10	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	8,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	8,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	8,000
	4	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	8,000
	5	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	8,000
	6	75	150	17,000	19,000	4,900	35,000	110,000	60,000	10,000	8,000
S 38	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	40,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	40,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	4	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	5	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	6	75	150	17,000	19,000	4,900	35,000	110,000	60,000	10,000	40,000

Note: a * indicates petrale areas are in place for that period
splitnose limits are the same as slope rock limits south of 40 10

Proposed RCA Boundaries and Cumulative Limits – Option B.1

		RCA Boundaries		Two Month Limits							
Subarea	Period	Inline	Outline	Sablefish	Longspine	Shortspine	Dover	Other Flat	Petrale	Arrowtooth	Slope Rock
North 40 10	1	75	200*	14,000	15,000	4,000	50,000	110,000	60,000	100,000	4,000
Large	2	75	200	14,000	15,000	4,000	50,000	110,000	30,000	100,000	4,000
Footrope	3	75	200	20,000	23,000	5,800	35,000	110,000	30,000	100,000	4,000
Limit	4	75	250	20,000	23,000	7,500	35,000	110,000	30,000	100,000	1,000
	5	75	250	20,000	23,000	7,500	35,000	110,000	30,000	100,000	1,000
	6	75	250*	14,000	15,000	4,000	35,000	110,000	60,000	100,000	1,000
North 40 10	1	75	200*	5,000	3,000	3,000	20,000	90,000	25,000	80,000	4,000
Select	2	75	200	7,000	3,000	3,000	28,000	90,000	25,000	80,000	4,000
Flatfish Twl	3	75	200	13,500	3,000	3,000	28,000	90,000	28,000	80,000	4,000
Limit	4	75	250	7,000	3,000	3,000	20,000	40,000	18,000	40,000	1,000
	5	75	250	7,000	3,000	3,000	20,000	40,000	18,000	40,000	1,000
	6	75	250*	5,000	3,000	3,000	20,000	40,000	18,000	40,000	1,000
38 - 40 10	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	8,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	8,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	8,000
	4	100	250	17,000	19,000	7,500	35,000	110,000	30,000	10,000	1,000
	5	100	250	17,000	19,000	7,500	35,000	110,000	30,000	10,000	1,000
	6	75	250*	17,000	19,000	4,900	35,000	110,000	60,000	10,000	1,000
S 38	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	40,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	40,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	4	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	5	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	6	75	150	17,000	19,000	4,900	35,000	110,000	60,000	10,000	40,000

Note: a * indicates petrale areas are in place for that period
shaded cells indicate changes from existing regulations
splitnose limits are the same as slope rock limits south of 40 10

Option-B.1 Projected Mortality

Estimated Mortality of Rebuilding and Target Species (mt)				
	Species	North	South	Total
Rebuilding Species	Canary	5.5	2.5	8.0
	POP	76.2	0.0	76.2
	Darkblotch	143.4	18.6	162.0
	Widow	0.6	0.0	0.6
	Bocaccio	0.0	47.9	47.9
	Yelloweye	0.0	0.1	0.1
	Cowcod	0.0	2.7	2.7
Target Species	Sablefish	2076.5	658.6	2735.1
	Longspine	252.7	478.6	731.3
	Shortspine	549.2	296.9	846.1
	Dover	5499.9	1631.2	7131.1
	Arrowtooth	4784.7	21.6	4806.3
	Petrale	1756.9	342.6	2099.5
	Other Flat	527.7	615.2	1142.9
	Slope Rock	180.1	195.9	375.9

Proposed RCA Boundaries and Cumulative Limits – Option B.2

		RCA Boundaries		Two Month Limits							
Subarea	Period	Inline	Outline	Sablefish	Longspine	Shortspine	Dover	Other Flat	Petrale	Arrowtooth	Slope Rock
North 40 10 Large Footrope Limit	1	75	200*	14,000	15,000	4,000	50,000	110,000	60,000	100,000	4,000
	2	75	200	14,000	15,000	4,000	50,000	110,000	30,000	100,000	4,000
	3	75	200	20,000	23,000	5,800	35,000	110,000	30,000	100,000	4,000
	4	75	250	20,000	23,000	7,500	35,000	110,000	30,000	100,000	1,000
	5	75	250	20,000	23,000	7,500	35,000	110,000	30,000	100,000	1,000
	6	75	250*	14,000	15,000	4,000	35,000	110,000	60,000	100,000	1,000
North 40 10 Select Flatfish Twl Limit	1	75	200*	5,000	3,000	3,000	20,000	90,000	25,000	80,000	4,000
	2	75	200	7,000	3,000	3,000	28,000	90,000	25,000	80,000	4,000
	3	75	200	13,500	3,000	3,000	28,000	90,000	28,000	80,000	4,000
	4	75	250	7,000	3,000	3,000	20,000	40,000	18,000	40,000	1,000
	5	75	250	7,000	3,000	3,000	20,000	40,000	18,000	40,000	1,000
	6	75	250*	5,000	3,000	3,000	20,000	40,000	18,000	40,000	1,000
38 - 40 10	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	8,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	8,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	8,000
	4	100	200	17,000	19,000	7,500	35,000	110,000	30,000	10,000	1,000
	5	100	250	17,000	19,000	7,500	35,000	110,000	30,000	10,000	1,000
	6	75	250*	17,000	19,000	4,900	35,000	110,000	60,000	10,000	1,000
S 38	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	40,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	40,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	4	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	5	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	6	75	150	17,000	19,000	4,900	35,000	110,000	60,000	10,000	40,000

Note: a * indicates petrale areas are in place for that period
shaded cells indicate changes from existing regulations
splitnose limits are the same as slope rock limits south of 40 10

Option-B.2 Projected Mortality

Estimated Mortality of Rebuilding and Target Species (mt)				
	Species	North	South	Total
Rebuilding Species	Canary	5.5	2.5	8.0
	POP	76.2	0.0	76.2
	Darkblotch	143.4	22.2	165.6
	Widow	0.6	0.0	0.6
	Bocaccio	0.0	47.9	47.9
	Yelloweye	0.0	0.1	0.1
	Cowcod	0.0	2.7	2.7
Target Species	Sablefish	2076.5	658.6	2735.1
	Longspine	252.7	478.6	731.3
	Shortspine	549.2	296.9	846.1
	Dover	5499.9	1631.2	7131.1
	Arrowtooth	4784.7	21.6	4806.3
	Petrale	1756.9	342.6	2099.5
	Other Flat	527.7	615.2	1142.9
	Slope Rock	180.1	195.9	375.9

Proposed RCA Boundaries and Cumulative Limits – Option B.3

		RCA Boundaries		Two Month Limits							
Subarea	Period	Inline	Outline	Sablefish	Longspine	Shortspine	Dover	Other Flat	Petrale	Arrowtooth	Slope Rock
North 40 10 Large Footrope Limit	1	75	200*	14,000	15,000	4,000	50,000	110,000	60,000	100,000	4,000
	2	75	200	14,000	15,000	4,000	50,000	110,000	30,000	100,000	4,000
	3	75	200	20,000	23,000	5,800	35,000	110,000	30,000	100,000	4,000
	4	100	250	20,000	23,000	7,500	35,000	110,000	30,000	100,000	1,000
	5	75	250	20,000	23,000	7,500	35,000	110,000	30,000	100,000	1,000
	6	75	250*	14,000	15,000	4,000	35,000	110,000	60,000	100,000	1,000
North 40 10 Select Flatfish Twl Limit	1	75	200*	5,000	3,000	3,000	20,000	90,000	25,000	80,000	4,000
	2	75	200	7,000	3,000	3,000	28,000	90,000	25,000	80,000	4,000
	3	75	200	13,500	3,000	3,000	28,000	90,000	28,000	80,000	4,000
	4	100	250	13,500	3,000	3,000	28,000	90,000	28,000	80,000	1,000
	5	75	250	7,000	3,000	3,000	28,000	90,000	28,000	80,000	1,000
	6	75	250*	5,000	3,000	3,000	20,000	90,000	25,000	80,000	1,000
38 - 40 10	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	8,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	8,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	8,000
	4	100	200	17,000	19,000	7,500	35,000	110,000	30,000	10,000	1,000
	5	100	250	17,000	19,000	7,500	35,000	110,000	30,000	10,000	1,000
	6	75	250*	17,000	19,000	4,900	35,000	110,000	60,000	10,000	1,000
S 38	1	75	150	17,000	19,000	4,900	50,000	110,000	60,000	10,000	40,000
	2	100	150	17,000	19,000	4,900	50,000	110,000	30,000	10,000	40,000
	3	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	4	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	5	100	150	17,000	19,000	4,900	35,000	110,000	30,000	10,000	40,000
	6	75	150	17,000	19,000	4,900	35,000	110,000	60,000	10,000	40,000

Note: a * indicates petrale areas are in place for that period
shaded cells indicate changes from existing regulations
splitnose limits are the same as slope rock limits south of 40 10

Option-B.3 Projected Mortality

Estimated Mortality of Rebuilding and Target Species (mt)				
	Species	North	South	Total
Rebuilding Species	Canary	5.5	2.5	8.0
	POP	76.2	0.0	76.2
	Darkblotch	143.4	22.2	165.6
	Widow	0.6	0.0	0.6
	Bocaccio	0.0	47.9	47.9
	Yelloweye	0.0	0.1	0.1
	Cowcod	0.0	2.7	2.7
Target Species	Sablefish	2086.6	670.6	2757.2
	Longspine	247.0	487.9	734.9
	Shortspine	528.5	304.7	833.2
	Dover	5600.9	1644.1	7245.0
	Arrowtooth	4786.2	22.8	4809.0
	Petrale	1915.7	326.6	2242.3
	Other Flat	550.0	630.2	1180.1
	Slope Rock	158.2	192.7	350.9

Widow Rockfish Bycatch Limits For The Whiting Fishery

At the March 2006 Council meeting, the GMT examined the 2006 whiting OY alternatives in relation to the impacts on overfished species. With a whiting OY of 269,069 mt and in the absence of any further restrictions, the widow rockfish catch was estimated to be approximately 122 mt. After considering the projected catch of overfished species in all other fishing and research activities, the Council recommended that the bycatch limit for widow rockfish be set at 200 mt.

Bycatch of widow rockfish in the whiting fishery was estimated to be at 95.65 mt through June 8, 2006. The GMT discussed the use of sector specific bycatch limits; however, such limits are not currently available as a routine management measure. The GMT concluded that sector specific bycatch limits should be considered as part of the biennial specifications process rather than an inseason management measure.

Widow rockfish catch in all groundfish fisheries is 111 mt through June 8, 2006. Estimates based on inseason data through June 8, 2006 indicates that 174 mt of widow rockfish are projected to be taken in the whiting fishery by the end of the primary whiting season. For all groundfish fisheries, the projected catch of widow rockfish is 233 mt. At this time (prior to June inseason actions), 31.1 mt of widow rockfish is unassigned to any fishery or research.

Whiting Fishery Catch Through June 8, 2006

Sector	Whiting Allocation (mt)	Whiting Catch (mt)	Widow Rockfish Catch (mt)	Fishery Status	Percent Of Whiting Allocation Taken
Shore-based	97,469	5,241	3.38	CA fishery 4/1-5/25; Coastwide fishery starts 6/15	.3%
Mothership	55,696	35,896	64.47	Started 5/15	64.4%
Catcher/processor	78,903	23,207	27.80	Started 5/15	29.4%
Total Commercial	232,069	64,344	95.65		27.7%
Tribal	35,000	175	0.00		0.5%

Widow Catch in the whiting fishery by year, 2001-2005

Sector	2001	2002	2003	2004	2005
Motherships	27.68	20.43	0.69	11.42	35.5
Catcher/Processors	139.71	114.79	11.56	8.21	43.14
Tribal	3.28	19.49	2.15	1.50	1.91
Shore-based	44.27	5.11	12.54	28.26	77.15

Lingcod Harvest Guideline

The 2006 commercial harvest guideline for lingcod of 214.7 mt is projected to be exceeded before the end of the year. However, the anticipated total catch is not expected to exceed either the lingcod OYs (1,801 mt north of 42° N. lat. and 612 mt south of 42° N. lat) or the ABC (2,716 mt). Allowing the commercial lingcod harvest guideline to be exceeded will prevent the commercial fishery from being unnecessarily constrained.

Allowance For NMFS Inseason Action Between Council Meetings (Triggers)

In recent years there has been limited ability to respond to unexpected changes in undesirable harvest trends between the June and September Council meetings. By September, there is often very little that can be done to reverse "bad trends." However, the Council could choose to specify a routine management measure that it would like NMFS to take if a specific undesirable harvest trend occurs in the fishery between Council meetings. For example, if higher than projected catch rates of key species reaches a pre-specified threshold, NMFS could respond by reducing trip limits or shifting RCA boundaries as specified by the Council at its previous meeting. A GMT and/or Council level conference call could be incorporated into this process, if necessary.

In meeting with the GAP, the GMT found that there was support for this idea as a mechanism for addressing concern for the potential loss of the period 6 fishery, and concern that factors influencing other fisheries (low shrimp catches, etc) could result in greater bottom-trawl effort. The GMT considered the following triggers and inseason actions:

- Canary rockfish
    - A) If the catch of canary in the LE bottom trawl sector is projected to reach 7.25 mt of the by August 31, NMFS will move the shoreward boundary of the RCA in to 60 fathoms north of 40° 10' N. lat. for period 5. The GMT will re-evaluate management measures relative to canary rockfish at the Council's September meeting.
    - B) If the catch of canary in the LE bottom trawl sector is projected to reach 7.75 mt of the end of a month, NMFS will move the shoreward boundary of the RCA in to the shore north of 40° 10' N. lat. at the end of that month. The GMT will re-evaluate management measures relative to canary rockfish at the Council's September meeting.

- Petrale Sole – If the catch of petrale sole in the LE bottom trawl sector is projected to reach 2,000 mt (72% of the OY) by August 31, NMFS will reduce cumulative limits for petrale sole for period 5. Petrale sole limits for each type of bottom trawl and each area will be reduced by 8,000 lbs per 2 months coastwide, and limits of Other Flatfish and arrowtooth will also be reduced to 4 times the petrale sole limit if those limits are more than 4 times the petrale sole limit. The GMT will re-evaluate management measures at the September meeting.

Open Access DTL Sablefish Limits

Current Open Access Sablefish Limits	
North of 40°10'	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 3,000 lb/ 2 months
40°10' - 36° N. lat.	

On May 1, 2006, per the Council's recommendation, NMFS reduced the OA DTL sablefish cumulative limit north of 36° N. lat. from 5,000 lb per 2 months to 3,000 lb per 2 months. The Council recommended this reduction in anticipation of a large influx of fishing effort into the DTL fishery as a result of salmon fishery closures. The minimal fishing gear needed to participate in the DTL fishery and numerous calls to fishery managers by new participants interested in entering in the fishery resulted in this concern. The amount of effort that could shift into the fishery could not be well estimated in April.

To date, the catch of OA sablefish appears to be higher in 2006 than catch projected from historical data. This supports the assumptions that restrictions in the salmon fishery may have resulted in increased effort in the OA DTL fishery, above what was expected for periods 1-3. Traditionally, most catches have occurred in the second half of the year, with period 4 (July-August) typically being the highest. If 2006 catches continue at a higher rate, then the OA sablefish allocation for the year would be taken under the current catch limits. Reducing the cumulative limit was intended to provide for a longer season, which was thought to most benefit fishers who have historically participated in the year-round fishery.

The GMT discussed the OA DTL limits with the GAP. At the GAP's request, the GMT considered when the fishery would reach the sablefish allocation under 2 month cumulative limits of 4,000 lbs and 5,000 lbs. With a 2-month cumulative limit of 4,000 lbs, the fishery is projected to reach the OA sablefish allocation in mid-November. With a 2 month cumulative limit of 5,000 lbs, the fishery is projected to reach the OA sablefish allocation in mid-October. With the current QSM system, it is not possible to look at the number of new entrants relative to last year.

The general consensus of the GMT was that effort-shift concerns are still high and would be more appropriately dealt with in September. Waiting to liberalize these limits until September, when effort shifts are better understood, would be unlikely to result in foregone yield, as measures taken in September could result in achieving targets by the end of the year.

RECREATIONAL

There are no inseason recreational proposals for Oregon or Washington, but both states report that their recreational fisheries are tracking behind expected catches at this point in time.

California Recreational Fishery

The GMT reviewed CDFG's proposed inseason changes to the current season structure for the recreational fishery provided in Agenda Item F.4.c CDFG Report and a revised set of tables provided during the GMT meeting (see Agenda Item F.4.c, CDFG Revised Supplemental Report). California's initial proposal increased the maximum fishing depth to 40 fm along the central and northern California coast. After review of available information on canary depth distributions, CDFG revised this proposal to extend fishing out to only 30 fm. The background for these proposed changes was discussed in the context of past "overages" by the recreational fishery prior to the implementation of the new recreational monitoring program (California Recreational Fisheries Survey – CRFS), and the rationale for expanding depth opportunities. Depth constraints have been imposed on the California recreational fishery since 2002. These constraints initially were imposed on only a part of the season, but in recent years fisheries in, areas such as central California have been constrained to approximately 20 fm throughout the season, raising concern about heavy fishing pressure on mostly unassessed nearshore rockfish stocks. Since CRFS estimates indicate bycatch of rebuilding species has been staying well below current targets, CDFG would like to move some of the fishing effort offshore, thereby relieving this fishing pressure.

The GMT acknowledged the benefit of moving anglers to deeper water to reduce pressure on nearshore rockfish stocks, but felt that these benefits needed to be weighed against the uncertainty of increased encounters with canary or widow rockfish. In particular, the GMT expressed concern over the increased impact on widow rockfish if fishing were allowed in depths to 40 fm. As part of the GMT discussion, CDFG shared information based on recreational sample data that indicated a higher probability of canary rockfish encounters between 30 and 40 fm, particularly at Deep Reef (San Mateo County) and some other spots in the North Central Rockfish and Lingcod Management Area.

The GMT also discussed the need for a rapid response if catches were projected to exceed California's recreational harvest guideline, as well as the inherent uncertainty in catch projections. There was some general discussion among the states that inseason tracking capabilities have improved to the extent that action can be taken in a timely fashion if expectations in the proposal are not met. The separate California harvest guideline and the capability of the new CRFS program to generate more timely catch estimates were identified as existing measures that help to minimize the resulting uncertainty.

Under the revised proposal, CDFG recreational model projection impacts on rebuilding species are expected to be: bocaccio 65 mt, canary rockfish 7.7 mt, widow rockfish 7.7 mt, cowcod 0.3 mt, lingcod 262 mt, and yelloweye rockfish 1.5 mt. All projected catch estimates continue to remain within harvest targets, allocations and/or California harvest guidelines. Impacts on target species are provided in Agenda Item F.4.c, CDFG Revised Supplemental Report.

The GMT supports the more moderate proposal provided in the CDFG Revised Supplemental Report. This will provide some relief to nearshore rockfish stocks while reducing the risks associated with moving to deeper waters. It also includes impacts to canary and widow rockfish that are more fully supported by the GMT. The 30 fm line in the CDFG Revised Supplemental Report is defined by waypoints, and may be more enforceable. In recognition of California's ability to track the fishery in a timely and accurate manner using CRFS, the ability to take prompt inseason action later in the year to close the fishery if expected harvests exceed projections should minimize the risk to overfished species associated with liberalizing the fishery.

A December lingcod opening was considered, but is not being recommended by the GMT. This is because the 2005-2006 EIS did not consider a year round lingcod fishery or fishing in December. Lingcod fishing was closed in December because of the need to protect them during spawning. In addition, the Council motion for California recreational management specifically included a December closure of the lingcod fishery. Benefits to overfished species that co-occur with lingcod as a result of the closures were also considered by the Council at that time. In addition, the groundfish Allocation Committee guidance to the GMT was to manage lingcod in 2006 under status quo management.

TRIBAL

The GMT discussed the Makah Tribe proposal to examine the effectiveness of different trawl gear configurations combined with area management to reduce impacts to overfished rockfish and Pacific halibut. To complete this work the Makah trawl fleet would create combined harvest targets for Dover sole and arrowtooth flounder that are equivalent to the limited entry cumulative limits specified for periods 4, 5, and 6 and which have been in place at the beginning of the year. When multiplied by the number of vessels (10) in the fleet, this represents a total fleet harvest target of 476.3 mt (1,050,000 lbs) for Dover sole and 1360.8 mt (3,000,000 lbs) for arrowtooth flounder. The GMT considered the tribal proposal and determined that the impact of the change is not expected to result in the OYs being exceed.

GMT RECOMMENDATIONS

- Adopt a 25 mt bycatch limit for darkblotched rockfish for the primary whiting fishery.

- Adopt Option B.1, B.2, or B.3. RCA modifications and trip limits for reducing darkblotched and canary rockfish catch in the non-whiting trawl fisheries north of 38° N. lat

- Allow the commercial lingcod harvest guideline to be exceeded.

- Recommend the adoption of triggers that allow NMFS to take action to restrict the non-whiting trawl fishery to reduce canary rockfish and petrale sole catch between the June and September Council meetings.

- Maintain the cumulative limits for sablefish in the OA DTL fishery at 3,000 lb/ 2 months and task the GMT with evaluating effort shifts into this fishery for potential inseason adjustments at the September meeting when further data become available.

- Consider inseason adjustments as proposed in the CDFG report under agenda item F.4.c.

- Consider tribal proposal to evaluate trawl gear effectiveness and area management.

PFMC
06/15/06

Estimated Total Mortality Impacts Updated with LE Trawl- Non-whiting Option B.1 - June 2006 Council Meeting

6/15/2006 14:54

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	**47.9**	**8.0**	2.7	**162.0**	**76.2**	**0.6**	**0.1**
Limited Entry Trawl- Whiting							
At-sea whiting motherships				4.7	1.0		0.0
At-sea whiting cat-proc		4.7		6.3	2.9	200.0	0.0
Shoreside whiting				5.2	1.8		0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9
Open Access: Directed Groundfish	10.6	3.0	0.1	0.2	0.1	0.1	3.0
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.0	0.3	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish d/							
WA		8.5					6.7
OR						1.4	
CA	60.0	9.3	0.4			7.0	3.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	2.0	3.0	0.1	3.8	3.6	0.9	1.0
Non-EFP Total	135.2	44.5	3.4	183.6	86.6	257.0	20.1
EFPs e/							
CA early season whiting S. of 40°10'	0.3	0.1	0.0	0.2	0.0	0.4	0.0
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	135.2	44.5	3.4	183.6	86.6	257.0	20.1
2006 OY	**309**	**47.0**	**4.2**	**200**	**447**	**289**	**27**
Difference	173.8	2.5	0.8	16.5	360.4	32.1	6.9
Percent of OY	43.8%	94.6%	81.0%	91.8%	19.4%	88.9%	74.3%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish. This suggests that total bocaccio was caught in trace amounts.

d/ Values for yelloweye in California represent specified harvest guidelines.

e/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Estimated Total Mortality Impacts Updated with LE Trawl- Non-whiting Option B.2 - June 2006 Council Meeting

6/15/2006 14:54

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	**47.9**	**8.0**	2.7	**165.6**	**76.2**	**0.6**	**0.1**
Limited Entry Trawl- Whiting							
At-sea whiting motherships				4.7	1.0		0.0
At-sea whiting cat-proc		4.7		6.3	2.9	200.0	0.0
Shoreside whiting				5.2	1.8		0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9
Open Access: Directed Groundfish	10.6	3.0	0.1	0.2	0.1	0.1	3.0
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.0	0.3	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish d/							
WA		8.5					6.7
OR						1.4	
CA	60.0	9.3	0.4			7.0	3.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	2.0	3.0	0.1	3.8	3.6	0.9	1.0
Non-EFP Total	135.2	44.5	3.4	187.2	86.6	257.0	20.1
EFPs e/							
CA early season whiting S. of 40°10'	0.3	0.1	0.0	0.2	0.0	0.4	0.0
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	135.2	44.5	3.4	187.2	86.6	257.0	20.1
2006 OY	**309**	**47.0**	**4.2**	**200**	**447**	**289**	**27**
Difference	173.8	2.5	0.8	12.9	360.4	32.1	6.9
Percent of OY	43.8%	94.6%	81.0%	93.6%	19.4%	88.9%	74.3%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was gr

d/ Values for yelloweye in California represent specified harvest guidelines.

e/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

Estimated Total Mortality Impacts Updated with LE Trawl- Non-whiting Option B.3 - June 2006 Council Meeting

6/15/2006 14:54

Fishery	Bocaccio a/	Canary	Cowcod	Dkbl	POP	Widow	Yelloweye
Limited Entry Trawl- Non-whiting	**47.9**	**8.0**	2.7	**165.6**	**76.2**	**0.6**	**0.1**
Limited Entry Trawl- Whiting							
At-sea whiting motherships				4.7	1.0		0.0
At-sea whiting cat-proc		4.7		6.3	2.9	200.0	0.0
Shoreside whiting				5.2	1.8		0.0
Tribal whiting		1.6		0.0	0.6	6.1	0.0
Tribal							
Midwater Trawl		1.8		0.0	0.0	40.0	0.0
Bottom Trawl		0.8		0.0	0.0	0.0	0.0
Troll		0.5		0.0	0.0		0.0
Fixed gear		0.3		0.0	0.0	0.0	2.3
Limited Entry Fixed Gear	13.4	1.2	0.1	1.3	0.4	0.5	2.9
Open Access: Directed Groundfish	10.6	3.0	0.1	0.2	0.1	0.1	3.0
Open Access: Incidental Groundfish							
CA Halibut	0.1	0.1		0.0	0.0		
CA Gillnet b/	0.5			0.0	0.0	0.0	
CA Sheephead b/				0.0	0.0	0.0	0.0
CPS- wetfish b/	0.3						
CPS- squid c/							
Dungeness crab b/	0.0		0.0	0.0	0.0		
HMS b/		0.0	0.0	0.0			
Pacific Halibut b/	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Salmon troll	0.2	1.6	0.0	0.0	0.0	0.3	0.2
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot Prawn (trap)							
Recreational Groundfish d/							
WA		8.5					6.7
OR						1.4	
CA	60.0	9.3	0.4			7.0	3.7
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.							
	2.0	3.0	0.1	3.8	3.6	0.9	1.0
Non-EFP Total	135.2	44.5	3.4	187.2	86.6	257.0	20.1
EFPs e/							
CA early season whiting S. of 40°10'	0.3	0.1	0.0	0.2	0.0	0.4	0.0
EFP Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	135.2	44.5	3.4	187.2	86.6	257.0	20.1
2006 OY	**309**	**47.0**	**4.2**	**200**	**447**	**289**	**27**
Difference	173.8	2.5	0.8	12.9	360.4	32.1	6.9
Percent of OY	43.8%	94.6%	81.0%	93.6%	19.4%	88.9%	74.3%
Key		= either not applicable; trace amount (<0.01 mt); or not reported in					

a/ South of 40°10' N. lat.

b/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

c/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was gr

d/ Values for yelloweye in California represent specified harvest guidelines.

e/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early.

DRAFT CALIFORNIA DEPARTMENT OF FISH AND GAME REPORT ON INSEASON MANAGEMENT PROPOSALS FOR THE 2006 CALIFORNIA RECREATIONAL FISHING SEASON

BACKGROUND AND PROPOSED ACTION

The Pacific Fisheries Management Council (Council) approved inseason changes to California's recreational 2005 season and depth structure at its March 2005 meeting. The Council, in adopting these changes, took into account a number of factors including: 1) the 2004 annual California Recreational Fisheries Survey (CRFS) estimates of recreational take which showed that harvest of overfished species was below their respective California recreational harvest targets in 2004; and 2) the improved ability for real-time inseason catch monitoring through the new CRFS program. The March 2005 inseason changes provided more recreational fishing opportunity while keeping projected impacts (derived from California's recreational catch model) within recreational harvest guidelines or allocations for overfished and constraining species.

In March 2006, complete CRFS estimates of recreational take for 2005 (through December) became available. These estimates indicated that even under this modified management structure adopted at the March 2005 meeting, the California recreational harvest guidelines or allocations for overfished species were not exceeded and, in some cases, catch was well below the projected impacts. However, due to the shallow water restriction of 20 fm in some areas, fishing pressure was increased on nearshore groundfish species resulting in take that met or exceeded these species OYs or harvest targets. These results suggest that the current 2006 management structure could be further modified to allow for additional fishing opportunities for shelf species such as vermilion rockfish (thereby reducing fishing pressure on nearshore groundfish species such as the nearshore rockfish and cabezon), while still remaining within recreational harvest targets for overfished and constraining species.

A proposed season and depth structure for the California recreational fishery is provided in Attachment 1. We request that the Council consider adopting at the June 2006 PFMC meeting these inseason management measures in federal waters for 2006.

A table with the impacts of this proposed inseason change is provided below. These impacts were projected using a modeling approach that has been reviewed and approved by the Groundfish Management Team for use in crafting 2007-2008 recreational fishery management options.

Prepared by: Debbie Aseltine-Neilson, Susan Ashcraft, Deb Wilson-Vandenberg, and Kirk Lynn

ESTIMATED IMPACTS RESULTING FROM ACTION:

Species		2005 CRFS Catch Estimates	Projected 2006 Catch Estimates Under Current Regulations	Projected 2006 Catch Estimates Under Proposed Changes	HG[1], updated impact estimate[2], or HT[3]
Rebuilding Species	Bocaccio	38	52	66	66[2]
	Canary	2.3	6.2	7.9	9.3[1]
	Cowcod	0.1	0.2	0.3	0.4[3]
	Darkblotched	0	0	0	0[2]
	Lingcod	300	256	228	422[1]
	POP	0	0	0	0[2]
	Widow	1.7	5.7	17.6	17.6[2]
	Yelloweye	1.7	1.5	1.3	3.7[1]
Other Target Species	Black RF	180	176	142	171[3]
	Minor NS RF North (40˚10' – CA/OR)	19.9	17.3	15.3	15.3[2]
	Minor NS RF South (40˚10' – US/Mexico)	430	447[5]	436[5,6]	383[3]
	Cabezon	41.8	43.0	33.5[6]	42.1[4]
	Greenlings	4.8	6.7	5.5	15.5[4]

1 – Harvest Guideline (HG) established in Federal Regulations

2 – Best estimate of recreational impact in 2006

3 – Harvest Target (HT): For black rockfish, this is the state-derived recreational harvest target within the Federal HG for CA recreational and commercial catch, combined. The black rockfish recreational target is derived from CA Fish and Game Commission allocation guidance between recreational and commercial sectors.

4 – Total Allowable Catch (TAC) established in State Regulations.

5 – Includes increased take of California scorpionfish projected under California regulations which now couples fishing for California scorpionfish with fishing for nearshore rockfish, resulting in the same seasons and depths for both.

6 – These species show a reduction in projected take under the proposed inseason change primarily because the projection model does not include an increase in catch due to an inshore shift in effort when fishing is at or greater than 40 fm.

Attachment 1. Proposed California Recreational Inseason Action for June 2006 PFMC Meeting.

NORTH COAST
(CA/OR Border to 40 ° 10' N Lat)

North Coast 2005 and 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					30	30	30	30	30	30	30	30
Black rockfish[2]					30	30	30	30	30	30	30	30
Cabezon, greenlings, CA sheephead, ocean whitefish					30	30	30	30	30	30	30	30
Lingcod					30	30	30	30	30	30	30	

North Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					30	30	40	40	40	40	40	40
Black rockfish[2]					30	30	40	40	40	40	40	40
Cabezon, greenlings, CA sheephead, ocean whitefish					30	30	40	40	40	40	40	40
Lingcod					30	30	40	40	40	40	40	

NORTH-CENTRAL COAST
40 ° 10' N lat to Lopez Point (36 ° 00' N lat)

North-Central Coast 2005 and 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish							20	20	20	20	20	20
California scorpionfish							20	20	20	20	20	20
Cabezon, greenlings, CA sheephead, ocean whitefish							20	20	20	20	20	20
Lingcod							20	20	20	20	20	
Sanddabs												

North-Central Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish							40	40	40	40	40	40
California scorpionfish							40	40	40	40	40	40
Cabezon, greenlings, CA sheephead, ocean whitefish							40	40	40	40	40	40
Lingcod							40	40	40	40	40	
Sanddabs												

SOUTH-CENTRAL COAST
Lopez Point (36 ° 00' N lat) to Pt. Conception (34 ° 27' N lat)

South-Central Coast 2005 and 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					40	40	40	40	40			
California scorpionfish					40	40	40	40	40			
Cabezon, greenlings, CA sheephead, ocean whitefish					40	40	40	40	40			

Lingcod					40	40	40	40	40			
Sanddabs												

South-Central Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish					40	40	40	40	40	40		
California scorpionfish					40	40	40	40	40	40		
Cabezon, greenlings, CA sheephead, ocean whitefish					40	40	40	40	40	40		
Lingcod					40	40	40	40	40	40		
Sanddabs												

SOUTH COAST
Pt. Conception (34 ° 27' N lat) to US/Mexico Border

South Coast 2005

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish			30-60	60	60	60	60	60	30	30	60	60
California scorpionfish										30	60	60
Cabezon, greenlings, CA sheephead, ocean whitefish			30-60	60	60	60	60	60	30	30	60	60
Lingcod				60	60	60	60	60	30	30	60	
Sanddabs												

South Coast 2006 (Current)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish			60	60	60	60	60	60	30	30	60	60
California scorpionfish										30	60	60
Cabezon, greenlings, CA sheephead, ocean whitefish			60	60	60	60	60	60	30	30	60	60
Lingcod				60	60	60	60	60	30	30	60	
Sanddabs												

South Coast 2006 (In-Season Proposal)

Species	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Nearshore & shelf rockfish			60	60	60	60	60	60	60	60	60	60
California scorpionfish			60	60	60	60	60	60		60	60	60
Cabezon, greenlings, CA sheephead, ocean whitefish			60	60	60	60	60	60	60	60	60	60
Lingcod				60	60	60	60	60	60	60	60	
Sanddabs												

CALIFORNIA DEPARTMENT OF FISH AND GAME REPORT ON REVISED INSEASON MANAGEMENT PROPOSALS FOR THE 2006 CALIFORNIA RECREATIONAL FISHING SEASON

In the Agenda Item F.4.c, CDFG Report, the California Department of Fish and Game provides an inseason proposal for the recreational 2006 groundfish fishery that includes changing the open recreational fishing depths from the Oregon/California border (42° N. lat.) to Lopez Point (46° N. lat) to 0-40 fm.. Under that proposal, the projected impact for widow rockfish in the bycatch scorecard increased to 17.6 although this additional impact was not expected to result in an increase above the OY. The projected increased impact on canary rockfish in the bycatch scorecard (6.2 mt) increased to 7.9 mt -- well under the harvest guideline.

After further review of the risks associated with moving anglers into deeper waters and a review of additional canary depth distribution information, concerns arose over the uncertainty of increased encounters with canary rockfish and widow rockfish above model estimates. Higher than projected canary or widow take could result in later inseason action to decrease the RCA boundary or close the fishery. Given that CDFG would like to prevent such an action, and given the unknown risks associated with the initial proposal, CDFG determined that a more prudent approach was warranted.

This revised supplemental report presents an alternative preferred proposal that provides for increasing the open recreational fishing depths to 30 fm from Cape Mendocino (42° 10' N. lat.) to Lopez Point as well as providing an additional month of fishing in the area between Lopez Point and Point Conception (34° 27' N. lat.). Similar to the previous proposal, this proposal includes increasing the depth in the Southern RLMA to 60 fms in September and October.

The rationale for relaxing the current depth restrictions is the same as that provided in the Agenda Item F.4.c CDFG Report. To summarize, the 2005 season and depth structure had been conservatively crafted using MRFSS data to minimize the possibility that recreational catches of some groundfish species of interest exceeded their harvest guidelines, or OYs. The 2005 California Recreational Fisheries Survey (CRFS) estimates of total recreational take showed that harvest of overfished species was well below their respective California recreational harvest targets, particularly for canary rockfish. CDFG wants to simplify regulations and relieve, where possible, economic burdens that resulted from overly restricted seasons and depths. In addition, CDFG has concerns about the pressure on "data poor" nearshore stocks that have received heavy fishing pressure since 2003 as fishing has been concentrated within 20 fms.

Under the revised proposal, recreational model projection results estimate canary rockfish impacts to be 7.7 mt when the North Central and South Central RLMAs are open to 30 fms. The projected impact for widow rockfish under this revised proposal would be 7.7 mt. All projected catch estimates continue to remain within harvest targets, allocations and harvest guidelines. CDFG continues to track catches on a monthly basis through the CRFS program.

The proposed season and depth structure for this revised alternative, and a table showing its projected impacts are provided below.

California Recreational Inseason Action Revised Alternative Proposal

Changes to Current 2006 Management (SQ):
DEPTHS: North Central and South Central Monterey areas - open 0-30 fm; South area Sep.- Oct. open 0-60 fm
MONTHS: Add October for South-Central Morro Bay

RCG SEASON BY REGION

<table>
<tr><th>Region</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North Region</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="8">> 30fm Closed</td></tr>
<tr><td>North Central</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="6">> 30fm Closed</td></tr>
<tr><td>South Central - Monterey</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="6">> 30fm Closed</td></tr>
<tr><td>South Central - Morro Bay</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="6">> 40fm Closed</td><td>---</td><td>---</td></tr>
<tr><td>South Region*</td><td>---</td><td>---</td><td colspan="10">> 60fm Closed</td></tr>
</table>

Notes and key for above table provided below.

NOTES AND KEY:
Shore fishing allowed in all waters in all months
RCG = Rockfish, cabezon, and greenlings
--- = Closed to boat-based fishing for RCG
Lingcod season is open only when RCG is open, except closed [December,] January, February & March for spawning.
[Suboption under this proposal would open lingcod fishing in Dec. in all areas but South Central Morro Bay.]
*In the South Region, CA scorpionfish is open 10 months: 0-60 fm for March-December.

Current 2006 Management Structure (Status Quo)

RCG SEASON BY REGION

<table>
<tr><th>Region</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>July</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td>North Region</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="8">> 30fm Closed</td></tr>
<tr><td>North Central</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="6">> 20fm Closed</td></tr>
<tr><td>South Central - Monterey</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="6">> 20fm Closed</td></tr>
<tr><td>South Central - Morro Bay</td><td>---</td><td>---</td><td>---</td><td>---</td><td colspan="5">> 40fm Closed</td><td>---</td><td>---</td><td>---</td></tr>
<tr><td>South Region*</td><td>---</td><td>---</td><td colspan="6">> 60fm Closed</td><td colspan="2">>30 fm</td><td colspan="2">> 60fm</td></tr>
</table>

NOTES AND KEY:

Shore fishing allowed in all waters in all months

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

Lingcod season is open only when RCG is open, except closed Dec, Jan, Feb & Mar for spawning.

*In all regions including the South Region, the CA scorpionfish season matches the nearshore RF season.

ESTIMATED IMPACTS RESULTING FROM ACTION:

Species		2005 CRFS Catch Estimates (Actual)	Projected 2006 Catch Estimates Under Current Regulations[7]	Projected 2006 Catch Estimates Under Proposed Changes	HG[1], updated impact estimate[2], or HT[3]
Rebuilding Species	Bocaccio	38	52	65	65[2]
	Canary	2.3	6.1	7.7	9.3[1]
	Cowcod	0.1	0.2	0.3	0.4[3]
	Darkblotched	0	0	0	0[2]
	Lingcod	300	254	262[6]	422[1]
	POP	0	0	0	0[2]
	Widow	1.7	5.6	7.7	7.7[2]
	Yelloweye	1.7	1.5	1.5	3.7[1]
Other Target Species	Black RF	180	176	172	171[3]
	Minor NS RF North (40˚10' – CA/OR)	19.9	17.3	17.3	17.3[2]
	Minor NS RF South (40˚10' – US/Mexico)	430	447[5]	480[5]	383[3]
	Cabezon	41.8	37.0	40.3	42.1[4]
	Greenlings	4.8	6.7	6.8	15.5[4]

1 – Harvest Guideline (HG) established in Federal Regulations
2 – Best estimate of recreational impact in 2006
3 – Harvest Target (HT): For black rockfish, this is the state-derived recreational harvest target within the Federal HG for CA recreational and commercial catch, combined. The black rockfish recreational target is derived from CA Fish and Game Commission allocation guidance between recreational and commercial sectors.
4 – Total Allowable Catch (TAC) established in State Regulations.
5 – Includes increased take of California scorpionfish projected under California regulations which now couples fishing for California scorpionfish with fishing for nearshore rockfish, resulting in the same seasons and depths for both.
6 – This is the projected impact for lingcod with December closed.
7 – The estimates for 2006 have been updated since the first inseason proposal for the June 2006 Council meeting was submitted.

In summary, the specific actions proposed related to recreational fishing for rockfish and associated species are:

- Increase recreational fishing depths from Cape Mendocino (42° 10’ N. lat.) to Lopez Point to 0-30 fm during open months
- Allow fishing out to 40 fms in October in the area between Lopez Point and Point Conception (34° 27’ N. lat.)
- Allow recreational fishing out to 60 fms in the Southern RLMA in September and October consistent with other months

- The season and depths for scorpionfish would be the same as the Southern RLMA season for rockfish, and associates species.

A suboption considered under this proposal would open lingcod fishing in December for all areas but South Central Morro Bay. However, this suboption is not possible as it was not considered in the 2005-2006 EIS.

Agenda Item F.4.c
Supplemental Tribal Comments
June 2006

MAKAH TRIBAL TESTIMONY ON IN-SEASON ADJUSTMENT IN GROUNDFISH FISHERY

Good morning Mr. Chairman, members of the Council. For the record my name is Russell Svec, Fisheries Manager for the Makah Tribe and with me this morning is Steve Joner, fishery biologist, and Brandon Bryant, groundfish biologist for the Makah Tribe.

The Makah Tribe proposes an in-season adjustment for groundfish for the remainder of 2006. We need the ability to redistribute the bi-monthly trip limits for Dover sole and arrowtooth flounder. We want to combine the bi-monthly cumulative limits for July and August, for September and October, and for November and December to give more flexibility to harvest these abundant species, while keeping bycatch rates low on Pacific Ocean perch (POP), canary rockfish, widow rockfish, and darkblotched rockfish.

We have two purposes for this in-season adjustment:

- The first purpose is to take our harvest guideline of Dover sole (476.3 mt) arrowtooth flounder (1360.8 mt) and blackcod without exceeding the caps on Pacific Ocean Perch and other depleted rockfish species, or on blackcod. We also want to minimize the bycatch of Pacific halibut during this period.

- In addition, we want to test different gear configurations in combination with area management to reduce impacts on these bycatch species.

Our fisheries for Dover sole and arrowtooth flounder currently have high catch rates and are relatively clean in terms of bycatch. The fishery targeting on Dover sole and arrowtooth flounder has a bycatch rate of 8.8 percent blackcod, and only 0.3 percent Pacific Ocean perch. Applying these bycatch rates to the remaining harvest targets for Dover sole and arrowtooth flounder, we could expect a bycatch of 6 metric tons of Pacific Ocean perch; however, our bycatch caps on blackcod would reduce the catch of Dover sole and arrowtooth flounder, so it is more likely that the POP bycatch would be even lower – perhaps by as much as half.

These bycatch numbers are well within the guideline for these species.

To achieve the second objective, we want to compare the difference in bycatch rates between standard bottom trawl gear with small footrope, and pineapple – cutback headrope gear. When we have the results from this commercial evaluation fishery, we will prepare a report to the Council summarizing our findings. We hope to have this report ready by the November 2006 Council meeting.

Thank you for your consideration of our proposal. We'd be glad to answer any questions you might have about this fishery.

GROUNDFISH ADVISORY SUBPANEL REPORT ON CONSIDERATION OF INSEASON ADJUSTMENTS

The Groundfish Advisory Panel (GAP) heard a presentation from the Groundfish Management Team on the need to consider inseason adjustments for the Daily Trip Limit (DTL) fishery, the California Recreational Fishery, the LE Trawl fishery and Whiting fishery with regards to Dark Blotched Rockfish. The GAP also heard a discussion from the whiting industry regarding the widow bycatch in the early part of At-Sea whiting fishery.

For Open Access the GAP recommends:

Deeper Nearshore Rockfish: Increase the deeper nearshore rockfish limits during period 5 from 400 lbs to 500 lbs from 34º27' N. lat. to 40°10' N. lat.

DTL: At the current rate, sablefish in the open access DTL fishery will come in short of full attainment. The GAP recommends increasing the DTL to 4,000 lbs, 1000 lbs per week or 300 lbs per day for the 2-month cumulative limit beginning on July 1. The GAP also recommends that we revisit this issue in September.

For the California Recreational Fishery the GAP is supportive of the CDFG proposal.
That is :

North Region:	Open inside of 30 fm from May to December
North Central:	Open inside of 30 fm from July to December
South Central, Monterey	Open inside of 30 fm from July to December
South Central, Morro Bay	Open inside of 40 fm from May to October
South Region	Open inside of 60 fm from March to December

LE Trawl Fishery with respect to darkblotched rockfish:

Beginning July1, move the seaward boundary of the RCA between 38º N. lat. and 40º10' N. lat. to 200 fm until the end of August, and then at the beginning of the period 5 move the seaward boundary of the RCA between 38º N. lat. and 40º10' N. lat. to 250 fm until the end of the year [with petrale sole modifications for period 6]. Moving out the line out to 250 fm in period 4 would preclude summer access to the DTS opportunity due to the limited bottom contours.

For the area north of 40º10' N. lat., the GAP recommends moving the line out to 250 fm until the end of the year with the petrale areas open in period 6.

Whiting Industry With Regards To Darkblotched Rockfish:

The whiting industry has been resisting yet another hard cap on the whiting industry. However, the industry does understand the difficult position that has been created by the high catches of dark blotched rockfish. The GAP did not have a consensus regarding the size of the hard cap in the whiting industry, oscillating between 25 to 30 mt. The LE Trawl Industry would like to see 25 mt hard cap on the whiting industry. The Whiting industry would like a 30 mt hard cap of dark blotched rockfish for 2006. The whiting industry would like the council to consider this as a hard cap for 2006 only.

LE Trawl: The GAP agrees with the GMT and recommends an increase for shortspines to 7500 lbs beginning July 1 north of 36º N. lat.

The GAP notes lingcod harvest is lagging far behind projected landings. Through June 6, 2006, QSM reports trawl landings to be on track under the harvest guideline allotted them. QSM reports coastwide catch through June 6th of 102 mt out of a 2006 OY of 2414 mt. 50% of this catch represents discard.

The GAP notes the very high discard rate and believes we should attempt to reduce discard by turning it into landed catch.

During the summer months, in particular during period 4, lingcod are intercepted as incidental catch in all shelf fisheries. Targeting by the trawl fishery is near non-existent. It is truly 100% incidental catch. Any increase in cumulative limits will be caught in directed fishing for other shelf species. Therefore, the GAP believes increasing lingcod landings by the trawl fishery will not increase or result in canary or yelloweye mortality.

The GMT reports that we have lingcod to burn north of 40º10' N. lat. The GAP recommends increasing the lingcod trip limits to 2000 lbs in the north to turn projected discards into landed catch. This action may require the Council revisiting and adjusting the scorecard harvest guideline as a result of this proposed action. This action is warranted. It will help relieve the economic cost imposed by high fuel cost. Any opportunity, which is justified, is needed to maintain viability in the trawl fleet. This measure will help!

The GAP strongly urges the Council to manage for maximum allowed harvest under OY limits to ensure lingcod, the most voracious predator feeding on juvenile overfished species such as canary and yelloweye. To do otherwise is irresponsible as we attempt to rebuild these stocks.

The GAP recommends that north of 40º10' N. lat. for period 4, that we leave the shoreward RCA line at status quo and utilize the August 31st trigger of 7.25 mt for canary rockfish impacts to move the line into 60 fm if that level of catch is reached. The canary rockfish impacts can then be re-evaluated at the September Council meeting.

Widow in the Whiting Industry:

The GAP heard a report from the whiting industry regarding the unusually high numbers of widow rockfish taken early in the season by the catcher-processor and mothership sectors. During the first ten days of the season, several tows with high widow rockfish occurred.

In response, the entire whiting industry began talks to determine what and if anything could be done to avoid encounters with widow rockfish for the rest of the season. These talks were productive and avoidance behaviors were adjusted.

Since May 26th, the encounters of widows in the at-sea whiting sectors have declined. In addition, effort in the at-sea whiting sectors has been greatly reduced. Therefore, the GAP is not recommending any sector split of widows for the 2006 whiting season.

PFMC
06/15/06

Dear Don,

I have fished for over 35 years and own a part in a crab processing cannery. This is the oldest continuously operating cannery on the Col. River. In the last year we began purchasing black cod, I have been out on the open access part with one of my sons. We have a $1500 electronic scale on the boat — we weigh one garbage can at a time — as the boat rolls — 99 — 102 — 101 — 99 — 100 — and so on — looks like a 100 ~~lbs~~ — dump them into the slush ice — do it again — 10 times = 1000 lbs — everyone usually has some extra to throw over — hopefully theyre alive. Any way we get to the cannery — up the hoist — And the weight is 1011 ~~lbs~~ — now what — was it slush ice theyre suspended in — taking on a little water — or the almost impossible chance to hit 100 each time?

Some guys draw a line around the garbage can, also one around the tote — but again a guess — if they are smaller they pack more and your over a little.

Believe me were trying to be honest — we're facing this dilema at our cannery right now.

How can we improve this program?

I know you guys are on the enforcement review at your next meeting — so let me try some thoughts from the fishermen and cannery

(2)

point of view — What if you created a relatively small range of overages – lets say 5% – 6% — or 50 Lbs. — something not very large — just enough to help make it possible to be close. There shouldn't be any incentive for the fisher to go over — so buyer would make out a state ticket and send the overage check to the state or Nat. Mar. fish –

Then the next part for no incentive is the obvious fact that what ever the overages add up to would come off the final bio mass that is allocated to the open access. You would get a pretty good picture of how the small overages add up — by mid season you would have a pretty good scientific picture of what the final adjustment would be — As you put a couple of years into this method I believe you would have a good picture how it works –

It is very hard to "hit" the number – and most fishermen don't want to throw them back — esp. at the cost of fuel — I would hope you wouldn't just drop the weekly level by 50 Lbs. for every delivery, because I believe in most cases guys will get pretty close either just below or a little above. With negative incentives – Pay the state (no wants to do that) and the adjusted loss from the total! Please think about this – only trying to keep us legal —

Sincerely – Steve Gray – 360 642-2408 –

MOTION IN WRITING ON CONSIDERATION OF INSEASON ADJUSTMENTS

The Makah Tribe is proposing commercial evaluation fisheries for the remainder of 2006 to test different gear configurations in combination with area management to reduce impacts to depleted rockfish as well as Pacific halibut.

I move that for both Dover sole and arrowtooth flounder, the Makah trawl fleet would have a combined harvest target equivalent to the limited entry cumulative limits for periods 4, 5, and 6 in place at the beginning of the year multiplied by the number of vessels (10) in the fleet. This represents a total fleet target of 1,050,000 lbs (476.3 mt) for Dover sole and 3,000,000 lbs (1360.8 mt) for arrowtooth flounder. These combined limits would allow them the flexibility to conduct these fisheries.

COUNCIL CLARIFICATION OF TENTATIVELY ADOPTED 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4 (IF NECESSARY)

This agenda item provides the chance for the Groundfish Advisory Subpanel (GAP) and the Groundfish Management Team (GMT) to present initial analysis of the 2007 and 2008 management measures tentatively adopted under Agenda Item F.2 and receive further clarification, guidance and direction from the Council. This guidance will be used to refine recommendations and analyses the Council may need to make final decisions on 2007 and 2008 management measures under Agenda Item F.6.

Council Action:

1. Provide Guidance to the GMT and GAP for Further Analysis of Management Measure Alternatives, if Necessary.

Reference Materials:

None.

Agenda Order:

a. Agenda Item Overview — John DeVore
b. State, Tribal, and Federal Agency Recommendations
c. Reports and Comments of Advisory Bodies
d. Public Comments
e. Council Discussion and Guidance on Final Adoption Necessities

PFMC
05/23/06

FINAL ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

This is the final step of three at this meeting (Agenda Items F.2 and F.5 being the other two) in the process to adopt final 2007-2008 groundfish fishery management measures that will be recommended to the U.S. Secretary of Commerce.

Council Action:

1. **Adopt Final Groundfish Harvest Specifications for 2007-2008 Fisheries.**
2. **Adopt Final 2007-2008 Groundfish Fishery Management Measures.**
3. **Adopt Amendment 16-4: Final Rebuilding Plans for Seven Depleted Groundfish Species.**

Reference Materials:

None.

Agenda Order:

a. Agenda Item Overview — John DeVore
b. State, Tribal, and Federal Agency Recommendations
c. Reports and Comments of Advisory Bodies
d. Public Comments
e. **Council Action**: Adopt Final Fishery Specifications, Management Measures, and Rebuilding Plan Revisions

PFMC
05/24/06

To: Pacific Fishery Management Council

From: Milton Love

Date: June 16, 2006

Re: 2007-08 Groundfish Management Measures and the Cowcod Conservation Area

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Regarding the Cowcod Conservation Area, I note with some disquiet yet another attempt to peel away some of the protections afforded by these closures.

Truly, this is the typical "Death By A Thousand Cuts" that is the traditional pattern of most fishery management around the world, where decent regulations are, over time, abraded by sheer dint of effort on the part of user groups and apparent fatigue by fishery managers. While both of these processes are understandable, and I even have a certain sympathy for all of the participants, one might ask, after all of the disastrous fishery management decisions that have occurred for several centuries, haven't we have evolved past this?

Here are some of the reasons that rolling back the size of the Cowcod Conservation Area footprint makes no sense.

1. **We don't know what lives in the rocky areas to be opened**. No one has conducted any surveys examining the densities of fishes and habitat-forming invertebrates (such as deep-water corals) in the areas suggested for opening. At the very least, it is not clear that cowcod do not live in the area to be opened to fishing. In this day and age, why would anyone allow the start of fishing operations of any sort in an area that has not been assessed?
2. **Fishing operations cannot be accurately monitored**. Having conducted surveys in much of the CCA, it is clear that there are numerous steep-sided areas where bottom depth drops off abruptly. In some areas, bottom depth may change hundreds of feet over a very short lateral distance. Given the limitations of the ship tracking devices, it is not credible that ship positions will be able to be assessed sufficiently accurately to detect either inadvertent or intentional poaching.
3. **The CCA protects more than cowcod**. The CCA protects all of the benthic organisms within its boundaries. Fishes and invertebrates of all types enjoy these benefits. Given that the stocks of most benthic fish species (let alone deepwater corals and other habitat-forming invertebrates) have not been properly assessed, why would it be prudent to allow greater take of these animals? For instance, in the depths that are proposed to be opened, blackgill rockfish (Sebastes melanostomus) are found. It is debatable whether the stock of this animal is in good shape, why then allow greater take?

I really like both the commercial and recreational fishing industries. I hope they become a lot healthier and more self-sustaining than they are today. But really, prudence should be the watchword here. Worldwide, prudence has not been in the vocabulary of much fishery management for a long time. Perhaps it can start here

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CALIFORNIA DEPARTMENT OF FISH AND GAME (CDFG) REPORT ON FINAL 2007-2008 MANAGEMENT MEASURES

Under the suite of ABCs/OYs adopted by the Council for all species, including those for species under rebuilding plans, the California Department of Fish and Game (CDFG) recommends the following commercial management measures for adoption:

Nearshore Commercial Fisheries Management

The suite of OYs adopted by the Council under Agenda Item F.2 provides for near-status quo management of California's nearshore commercial fisheries north of 40°10' N latitude, and some adjustments to the management measures for the area south of 40°10' N latitude consistent with Action Alternative 3b as described in Table 2-12a of the DEIS. The trip limits contained in the tables below reflect the CDFG's recommendation for trip limits for 2007-08.

North of 40°10' N latitude to 42° N latitude

- Adopt Action Alternative 3b: Status quo federal trip limits and a year-round RCA boundary of 30 fm. This alternative keeps impacts to canary and yelloweye rockfish within targets.

South of 40°10' N latitude:

- Adopt Action Alternative 3b, which provides for a 10 month season at 30 fm, modified to provide for increases in trip limits as detailed below.
- Trip limit options are based on the Department's intent to use a precautionary harvest guideline in drafting management measures. The Federal harvest goal is 564 metric tons (mt), while the Department's management goal is 515 mt for minor nearshore rockfish south of 40°10' N latitude. This translates into a commercial allocation of 120 mt, which represents a 23 mt increase over the status quo HG of 97 mt. Of the proposed 120 mt HG, 78 mt are proposed for the shallow nearshore rockfish group and 42 mt for the deeper nearshore rockfish group.
- During the March – April annual closure, shelf rockfish need to be closed to prevent discard of nearshore species when targeting shelf rockfish.
- Trip limit increases: In light of an increase to the minor nearshore rockfish OY and an associated increase in commercial harvest guideline from 97 mt to 120 mt, increases in trip limits can be provided for, with little increased impact to overfished species.
- Catch levels will be closely tracked inseason to evaluate appropriate inseason adjustments to RCA boundaries and trip limits if needed.

Shallow Nearshore Rockfish Trip Limits:

Status quo and CDFG-preferred trip limits (in pounds per 2 months)		
Period	STATUS QUO	CDFG-Preferred
1	300	500
2	closed	closed
3	500	700
4	600	800
5	500	700
6	300	500

Deeper Nearshore Rockfish Trip Limits:

Status quo and CDFG-preferred trip limits (in pounds per 2 months)						
Between 40°10' and 34°27'				Between 34°27' and US/Mexico		
Period	STATUS QUO	CDFG-Preferred		Period	STATUS QUO	CDFG-Preferred
1	500	700		1	500	500
2	closed	closed		2	closed	closed
3	500	700		3	600	600
4	500	700		4	600	600
5	400	600		5	600	600
6	500	700		6	400	400

Limited Entry Trawl

Darkblotched Rockfish Conservation Area

The CDFG proposed two polygon areas between 40°10' N latitude and 38° N latitude for designation as Darkblotched Rockfish Conservation Areas (DRCAs) (Agenda Item F.2.b CDFG Report). Staff consulted with industry representatives and revised the coordinates relative to their input. The industry's input focused on 1) revisions to the southern portion of the Pt. Arena DRCA to allow continued harvest of bank rockfish that occur there; 2) explanation of the importance of the proposed areas as winter petrale fishing grounds and concern that any adopted DRCAs be restricted to periods outside of the winter petrale season; and 3) willingness to support the two polygon closures provided that they would result in higher slope rockfish target limits during periods when the DRCAs are in place. CDFG believes that there are data that may assist in evaluating these areas for potential catch savings, however, CDFG is willing to work with the GMT relative to whether DRCAs and higher slope rockfish trip limits can be implemented together, and is willing to work further with industry representatives to finalize coordinates that are agreeable to all parties. Analysis to date will be included in the DEIS, and it is our understanding that DRCAs may be implemented during 2007 or 2008 through a Tiered EA with our assistance.

OREGON DEPARTMENT OF FISH AND WILDLIFE REPORT DETAILING THE PREFERRED ALTERNATIVE FOR MANAGEMENT OF THE OREGON RECREATIONAL GROUNDFISH AND COMMERCIAL GROUNDFISH FISHERIES IN 2007 AND 2008

This report details Oregon Department of Fish and Wildlife's (ODFW) preferred management measures for the 2007 and 2008 recreational and commercial groundfish fisheries. ODFW recommends the Council adopt the following management measures:

RECREATIONAL

The Oregon Department of Fish and Wildlife (ODFW) recommends adoption of Alternative 3b (described in Chapter 2 of the preliminary Draft EIS, p. 90), as modified in this report, for the Oregon recreational groundfish fisheries in 2007 and 2008. This preferred season structure (Table 1) produces a fishery that is open offshore year round, except from April 1 to September 30 when fishing is only allowed shoreward of 40 fathoms. Estimated impacts for yelloweye rockfish and canary rockfish associated with this preferred alternative are 3.2 mt and 4.3 mt respectively. We recommend a marine fish[a/] daily bag limit of eight fish in aggregate and a flatfish daily bag limit of 25 fish in aggregate, consisting of all soles and flounders except Pacific halibut. The lingcod daily bag limit is two with a 22-inch minimum length limit.

Table 1**:** ODFW preferred 2007-2008 Oregon recreational groundfish fishery management measures.

<table>
<tr><th colspan="12">Season Structure</th><th colspan="4">Bag/Length Limits</th><th colspan="2">Impacts</th></tr>
<tr><th colspan="12">Month</th><th rowspan="2">Marine Species Daily Bag[a/]</th><th rowspan="2">Flatfish Daily Bag[b/]</th><th rowspan="2">Ling Daily Bag</th><th rowspan="2">Lingcod Length Limit</th><th rowspan="2">Yelloweye Impact (mt)</th><th rowspan="2">Canary Impact (mt)</th></tr>
<tr><th>J</th><th>F</th><th>M</th><th>A</th><th>M</th><th>J</th><th>J</th><th>A</th><th>S</th><th>O</th><th>N</th><th>D</th></tr>
<tr><td colspan="3">All depth</td><td colspan="6"><40 fm</td><td colspan="3">All depth</td><td>8</td><td>25</td><td>2</td><td>22</td><td>3.2</td><td>4.3</td></tr>
</table>

[a/] Marine bag includes all species other than lingcod, salmon, steelhead, Pacific halibut, flatfish, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine and smelt
[b/] Flatfish bag consists of all soles and flounders except Pacific halibut

Marine Fish Daily Bag Limit: ODFW recommends adoption of a marine fish daily bag limit of 8 fish in aggregate (as defined above). This will provide management flexibility to make necessary adjustments to the marine fish daily bag limit through the yearly state process, reflecting the progression of the current year's fishery. The species most affected by adjustments in the marine fish daily bag limit is black rockfish. The fishery will be managed within the black rockfish harvest guideline.

Flatfish Daily Bag Limit: ODFW recommends adoption of a flatfish daily bag limit of 25 fish in aggregate (excluding Pacific halibut), removing flatfish from the status quo definition of "marine fish".

Lingcod Daily Bag Limit: ODFW recommends adoption a lingcod daily bag limit of 2 fish, carrying forward the current bag limit.

Minimum Length Limits: ODFW recommends adoption of a minimum length limit of 22-inches for lingcod. This adjustment should reduce time on the water by allowing anglers to achieve the lingcod bag limit quicker, and thus reduce impacts to depleted rockfish species (primarily canary rockfish and yelloweye rockfish) as well as constraining target species (i.e. black rockfish). This will also provide more access to the increased amount of harvestable lingcod available. Analysis shows that more lingcod are expected to be harvested due to decreasing the minimum length limit than increasing the daily bag limit. ODFW also recommends continuation of the minimum length limits for cabezon and kelp greenling of 16-inches and 10-inches respectively.

Stonewall Bank YRCA: ODFW recommends prohibiting groundfish retention within a defined area (Table 2), encompassing the high relief rocky habitat of Stonewall Bank, residing approximately 15 miles offshore from Newport, Oregon. There currently exists a Stonewall Bank Yelloweye Rockfish Conservation Area, adopted in Pacific halibut rules, which is closed to the retention of Pacific halibut only. Implementation of this same area (p. 55, Chapter 2, DEIS) in the groundfish fishery would aid in the conservation of depleted rockfish species. Targeting and retention of Pacific halibut and groundfish would be prohibited in the area year-round. Data is currently being collected to determine if anglers targeting Pacific halibut in the open areas of Stonewall Bank are also encountering yelloweye rockfish. This data will be used to determine if expansion of the adopted area is warranted for both the 2007 Pacific halibut fishery and the 2007-2008 groundfish fishery.

Table 2: Coordinates of the ODFW recommended Stonewall Bank YRCA.

ID#	Degrees	Minutes	Degrees	Minutes
1	44	37.46	124	24.92
2	44	37.46	124	23.63
3	44	28.71	124	21.80
4	44	28.71	124	24.10
5	44	31.42	124	25.47

Groundfish retention in the all-depth Pacific halibut fishery: Currently only sablefish may be retained in the Pacific halibut fishery at any depth in the area from Cape Falcon to Humbug Mountain, Oregon. North of Cape Falcon both sablefish and Pacific cod may be retained at any depth during the Pacific halibut fishery. It is expected that groundfish retention in the all-depth Pacific halibut fishery will be similarly constrained in 2007 and 2008.

Inseason Management: The inseason actions that may be implemented if the 2007 or 2008 Oregon recreational groundfish fishery does not proceed as expected include: length limit adjustments, bag limit adjustments (including non retention), and season, depth, and area closures.

Depth management will be the main inseason tool for controlling canary rockfish and yelloweye rockfish harvest, as retention is prohibited. Offshore closures may be implemented inseason at

30, 25, or 20 fathoms as the presence of these two species is reduced nearshore and release survival increases. ODFW will monitor inseason progress toward recreational harvest targets for canary rockfish and yelloweye rockfish. If inseason catch projections indicate that one or both of the state harvest targets may be exceeded, ODFW and WDFW will consult to share catch information. If the states determine that a management response is necessary to avoid exceeding the Oregon-Washington harvest guideline of canary or yelloweye rockfish, then the appropriate agency(ies) will implement inseason management actions to reduce catches, as necessary. Regulations will depend upon the timing of the determination for their need.

Adjustments to the daily marine fish bag limit may be implemented to achieve season duration goals in the event of accelerated or decelerated black rockfish or other nearshore rockfish harvest. Season and/or area closures may also be considered if harvest targets are projected to be attained. Non-retention and length restrictions are the likely inseason tools to use for cabezon and greenling as release survival is very high. They may also be used to reduce impacts on nearshore species, such as black rockfish.

Gear restrictions and/or release technique requirements may be implemented to reduce the impact of overfished rockfish species if successful techniques are developed, researched, reviewed, and accepted. Research in this area is currently being conducted, testing the effectiveness and selectivity of various gears and the survivability of rockfish released at depth.

Directed yellowtail rockfish and/or flatfish fisheries may be implemented inseason, as were implemented in 2004, in the event of a closure of the recreational groundfish fishery due to attainment of target species harvest guidelines or state harvest caps. Specific gear restrictions may be implemented in the event that flatfish remains open during a groundfish closure. Fisheries will be monitored to ensure that impacts to yelloweye and canary rockfish are not in excess of the harvest targets.

In the event that the duration of total season is reduced from 12 months, or the nearshore waters are closed to groundfish fishing due to management of nearshore species, the fishery may be expanded to waters seaward of the RCA that is in effect at the time, promoting directed yellowtail rockfish and offshore lingcod opportunity. Fisheries will be monitored to ensure that impacts to yelloweye and canary rockfish are not in excess of the harvest targets.

COMMERCIAL

Commercial Limited Entry Fixed Gear and Open Access Fisheries

ODFW recommends adoption of a 22-inch minimum length requirement for lingcod in the limited entry fixed gear and open access fisheries off Oregon and Washington. This will provide consistency with lingcod minimum length requirements in the recreational fisheries in Oregon and Washington. Industry representatives have asserted that there is a viable market for smaller lingcod, primarily in the live-fish fishery off Oregon. This action would allow fishers to retain previously discarded fish, and access the increased allowable harvest of lingcod in 2007 and 2008.

Commercial Limited Entry Bottom Trawl Fishery

ODFW recommends the required analysis (DEIS) be conducted to provide the ability to implement a “one-gear-on-board” per cumulative period regulation in the bottom trawl fishery as a routine management measure in 2007-2008 for the purpose of partitioning the trawl fleet and improving catch projection modeling.

Commercial Nearshore Fishery

ODFW recommends adoption of Action Alternative 3b as described on p. 88 in Chapter 2 of the preliminary draft EIS. This alternative provides for a near status quo fishery shoreward of 30 fathoms, and results in updated expected impacts for canary rockfish, widow rockfish, and yelloweye rockfish of 1.7, 0.1, and 2.1 mt, respectively. The fishery would operate for 12 months under federal and state harvest guidelines and federal trip limits (northern California) and state harvest caps and state trip limits (Oregon). The fishery will be closely monitored inseason and trip limits will be adjusted via federal or state inseason action to avoid exceeding federal harvest guidelines or state harvest caps for target species. In the event that new information indicates that the projected impacts to depleted species would be exceeded, the fishery may be adjusted using depth based management tools. A 20-fathom open access RCA line is being added to the list of available inseason tools.

ENFORCEMENT CONSULTANTS REPORT ON FINAL ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

The Enforcement Consultants (EC) has the following comments regarding agenda item F.6 Final Adoption of 2007-2008 Groundfish Fishery Specifications/Management Measures and Amendment 16-4.

Cowcod Conservation Area

During this discussion, I will be referring to Figure 2-12 Cowcod West, Alternative 2, 175 fm Contour, found on page 79 of Agenda Item F.2.a, Attachment 1, June 2006.

Regarding the Cowcod Conservation Area (CCA) Alternative 2, 175 fm Contour, the EC understands that industry would like to have the opportunity to fish for blackgill and other species outside the 175 fm contour in areas currently closed within the CCA. The industry proposes allowing fishing outside this fathom contour by vessels equipped with vessel monitoring systems (VMS). Our understanding is that up to 9 limited entry fixed gear vessels may participate in this fishery with an unknown number potentially entering the fishery after January 1, 2007 when open access is required to have VMS.

We understand the vessels participating in this fishery participate in the fixed gear observation pool. But within this fixed gear pool, vessels who participate in overnight trips and some which are deemed un-seaworthy are exempt. We find this troublesome and believe the Council may want to consider increased observer coverage if this fishery proposal goes forward. Given the proposed 07-08 four ton cowcod optimum yield (OY), and the fact that one tenth of a ton has been projected for this proposed fishery in the bycatch scorecard, the EC views this fishery as a “zero tolerance” bycatch fishery.

I refer you to Figure 2.12, where the 150 and 175 fm contour are replicated. To maximize fishing opportunity, the industry would like see the 175fm contour replicated to the greatest resolution practicable using a series of lat/long way points. The NMFS Office of Law Enforcement and California Fish and Game Enforcement are prepared to undertake this mapping exercise as a first measure in redefining open fishing area within the status quo CCA. Once this mapping exercise is completed, enforcement will be faced with the tasked of enforcing open/closed areas with extremely close tolerances, some as small as 100 yards or up to a quarter mile.

Vessels operating in this fishery travel at a speed of 6 to 8 knots on average, and may deploy vertical longline gear in as short of time as 20 minutes. The current VMS pinging standard for the West Coast Rockfish Conservation Area is once every 60 minutes. This rate was established after considering the Council’s long standing request to keep VMS costs as a minimum. The pinging rate in every other region of the country is once every 30 minutes. Considering the operational times and vessel speed employed in this fishery, and the extremely small distances between 150 fm (identified as cowcod habitat) and 175 fm (identified as black gill habitat), the EC recommends increasing the pinging rate for this proposal to four times an hour or every 15 minutes. We hope this increased pinging rate will provide the fishing track resolution necessary to insure the integrity of the closed areas given these very close distance tolerances.

The current transmitting costs to fishermen at once an hour is on average approximately $30 a month. This proposal will increase that transmittal costs to approximately $100 or more a month, a $70 or more per month increase in operating costs.

If this fishing opportunity is approved, the EC recommends the current CCA geographic definition be maintained, and that new regulatory language be crafted requiring vessels carrying groundfish fixed gear, hook-and-line, pot, or trawl gear, and entering the status quo CCA, be equipped with VMS units which are operational and pinging at 15 minute intervals.

Regarding transiting the closed fishing areas within the CCA, the EC has considered the industries desire to transit these closed fishing area. Given the zero tolerance for fishing bycatch of cowcod in these areas, the EC cannot recommend allowing transiting of the closed fishing areas. The EC recommends that the closed areas identified on page 79 be closed to all fishing and all transiting of vessels carrying groundfish fixed gear, hook-and-line, pot, or trawl gear.

Finally, the EC would like to remind the Council that VMS is a spatial monitoring tool and as such does not ensure compliance of unlawful possession or nonretention regulations. Given the distant location of this fishery and its close proximity to prohibited species habitat, the EC has great reservations regarding this fishery's ability to demonstrate zero cowcod bycatch.

Trawl Gear

The EC supports the GMT recommendation that trawl vessels be limited to one trawl net type in a two month period.

PFMC
06/16/06

GROUNDFISH ADVISORY SUBPANEL (GAP) REPORT ON FINAL ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

The Groundfish Advisory Subpanel (GAP) recommendations on commercial fishery seasons, trip limits and rockfish conservation area (RCA) boundaries are as follows.

Limited Entry Trawl

The GAP agrees with the GMT's recommendations on limited entry trawl RCA and cumulative trip limits coastwide.

GAP members became aware of a proposal to limit the fleet to one gear on board per cumulative limits for the 2007-2008 fisheries. GAP members voiced concern over receiving the proposal on the Friday morning of the final action agenda item. The GAP understands that this proposal results from the GMT's hope they could better estimate effort shifts.

A subcommittee of the GAP explored the option briefly and has the following comments:

1. **Cost.** The costs associated with this proposal are large. The proposal would require fishermen to return to port between cumulative periods and switch their gear. Currently the vessels are allowed to have both gears on board. The costs associated with switching the gear can be significant.
2. **Flexibility**. The proposal limits the fleet's flexibility to access fish when and where they become available.
3. **Effectiveness**. Given the uncertainty of availability of target fish and the variability of bycatch species the GAP does not believe that this restriction will increase the accuracy of bycatch or target species actual catch.

The GAP realizes that this option was initially proposed prior to consideration of a trigger mechanism that allows for management action between Council meetings. The GAP believes that the trigger mechanism will be sufficient to adjust management measures as necessary. The trigger mechanism is the GAP's preferred alternative for dealing with this issue. Other options include some type of declaration system or an information sharing meeting where the GMT meets with members of the fleet to discuss their expected "game plans" for the upcoming season.

The GMT is also proposing that selective trawl gear be required south of 40˚10 in order to avoid bocaccio rockfish capture. The GAP notes that there is little or no data on the effectiveness of this gear south of 40˚10 with respect to bocaccio. Furthermore, the GAP is confident that the next bocaccio stock assessment will reflect a significantly higher, if not rebuilt, population of bocaccio. With this in mind the GAP believes that the costs associated with requiring this gear south of 40˚10 poses an unnecessary economic hardship on the fleet when the gear may become irrelevant within the next management cycle.

Limited Entry Fixed Gear

The GAP recommends status quo management measures for limited entry fixed gear north of 40º10' N. lat.

The GAP also recommends status quo management measures for limited entry fixed gear south of 40º10' N. lat. with the following exceptions:

- The 34º27' N. lat. management line is recommended for stratifying management measures for thornyheads.
- Increase the California scorpionfish cumulative trip limit to 600 lbs/2 months during periods 1, 3, and 6; increase to 800 lbs/2 months during periods 4 and 5.
- Increase the shallow nearshore rockfish cumulative trip limit to 600 lbs/2 months during periods 1 and 6; increase to 800 lbs/2 months during periods 3 and 5; and increase to 900 lbs/2 months during period 4.
- Increase the deeper nearshore rockfish cumulative trip limit north of 34º27' N. lat. to 600 lbs/2 months during period 5; increase the deeper nearshore rockfish cumulative trip limit south of 34º27' N. lat. to 600 lbs/2 months during period 6.
- Increase the lingcod cumulative trip limit to 100 lbs/ month during periods 1 and 6.

Open Access

The GAP recommends Alternative 3b management measures for open access gears north of 40º10' N. lat. with the following exceptions:

- Increase the lingcod cumulative trip limit to 400 lbs/month from May through November.

The GAP also recommends status quo management measures for open access gears south of 40º10' N. lat. with the following exceptions:

- The 34º27' N. lat. management line is recommended for stratifying management measures for thornyheads.
- Increase the California scorpionfish cumulative trip limit to 600 lbs/2 months during periods 1, 3, and 6; increase to 800 lbs/2 months during periods 4 and 5.
- Increase the shallow nearshore rockfish cumulative trip limit to 600 lbs/2 months during periods 1 and 6; increase to 800 lbs/2 months during periods 3 and 5; and increase to 900 lbs/2 months during period 4.
- Increase the deeper nearshore rockfish cumulative trip limit north of 34º27' N. lat. to 600 lbs/2 months during period 5; increase the deeper nearshore rockfish cumulative trip limit south of 34º27' N. lat. to 600 lbs/2 months during period 6.
- Increase the lingcod cumulative trip limit to 300 lbs/ month during November; increase to 100 lbs/ month during December.

The GAP recommends recreational management measures as follows.

California Recreational Management Measures

The GAP recommends option 5b California recreational seasons and open depths as follows:

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North Region	---	---	---	---	> 30 fm Closed							
North Central	---	---	---	---	---	> 30 fm Closed						---
South Central - Monterey	---	---	---	---	> 40 fm Closed							---
South Central - Morro Bay	---	---	---	---	> 40 fm Closed							---
South Region	---	---	> 60 fm Closed									

NOTES AND KEY:

RCG = Rockfish, cabezon, greenlings

--- = Closed to boat-based fishing for RCG

The estimated impacts under option 5b are:

	Estimated Impacts (mt)								
Region	**Yelloweye**	**Canary**	**Cowcod**	**Bocaccio**	**Widow**	**Minor NS RF North**	**Minor NS RF South**	**CA Scorpionfish**	**Lingcod**
North region	0.9	0.7	N/A	N/A	0	17.3	N/A	0	51
North Central	0.6	5.5	0	0.2	2.2	N/A	165	0	152
South Central - Monterey	0	0.5	0	7.4	0.9	N/A	104	0	29
South Central - Morro Bay	0	1.3	0	2.5	0.1	N/A	92	0	24
South Region	0	0.3	0.3	57.4	5.2	N/A	61	75	26
TOTAL CALIFORNIA	1.7	8.3	0.3	67.5	8.4	17.3	422	75	282

Oregon Recreational Management Measures

Yelloweye: The GAP recommends a no-action management measure as described in agenda item F.2.b, ODFW Report June 2006. Also recommended is an ability to change to alternative more restrictive depth based management measures should the yelloweye impacts exceed a rate compatible with preseason projections. This in-season constraint ability would allow for a lowering of the impact rate.

Lingcod: The GAP recommends a change of the lingcod minimum length from 24” to 22”.

Bag limit: The GAP recommends that the bag limit be limited to no less than 5 fish with all management measures as indicated through Oregon public comment. A depth constraint or season closure is preferred to a bag of less that 5. Flat fish 25 bag limit in aggregate not to include Pacific Halibut.

Washington Recreational Fisheries

Statewide Measures:

- Maintain status quo bag limits as described in the No Action Alternative (Chapter 2, p. 52), which include a recreational groundfish bag limit of 15 fish per day, including rockfish and lingcod, with a sublimit of 10 rockfish, and 2 lingcod. Retention of canary and yelloweye rockfish is prohibited.

- Maintain status quo lingcod season as described in the No Action Alternative (Chapter 2, p. 52); in 2007 and 2008, the following lingcod seasons would apply:

    - Marine Areas 1-3: Open the Saturday closest to March 15 (which is March 17 in 2007 and March 15 in 2008) through the Saturday closest to October 15 (which is October 13 in 2007 and October 18 in 2008).

    - Marine Area 4: Open April 15 through October 13 in 2007 and open April 15 through October 15 in 2008.

- Reduce the minimum size for lingcod from 24 inches to 22 inches.

Area-Specific Measures:

Management Measures for Marine Areas 3 and 4 (Queets River to U.S./Canada border)

Action Alternative 3 (Chapter 2, p. 89), with two revisions: Prohibit fishing for, retention, and possession of **groundfish** seaward of a line approximating 20 fm from May 1 through **September 30**, except on days that halibut fishing is open.

Revisions:
1. Change "rockfish and lingcod" to more broadly cover "all groundfish" for ease of regulatory understanding and enforcement of the regulations
2. Move the depth restriction in July from 10 fm seaward to 20 fm

Management Measures for Marine Area 2 (Leadbetter Pt. to the Queets River)

Action Alternative 3 (Chapter 2, p. 89), with one revision: Prohibit fishing for, retention, and possession of **groundfish** seaward of a line approximating 30 fm from the lingcod opening day in March through April 30, and from June 16 through July 31. From May 1 through June 15 (i.e., during the average period of the South Coast halibut fishery), allow the retention of sablefish and Pacific cod seaward of the 30-fm depth restriction.

Revision:

1. Change “rockfish and lingcod” to more broadly cover “all groundfish” for ease of regulatory understanding and enforcement of the regulations, while still allowing the retention of sablefish and Pacific cod, which may be caught incidentally while targeting halibut offshore.

Management Measures for Marine Area 1 (Oregon/Washington border to Leadbetter Pt.)

No Action Alternative (Chapter 2, p. 54), which would prohibit fishing for, retention, and possession of groundfish, except sablefish and Pacific cod, when Pacific halibut are onboard the vessel.

<u>Cowcod Conservation Area Boundary Changes</u>

The GAP supports the Alternative 2 Cowcod Conservation Area West boundary change to allow vessels equipped with VMS to fish within the bounds of the current CCA in depths greater than 175 fm. These new open areas are important for accessing healthy slope species, such as blackgill rockfish, and will not impact cowcod, which are not found in these areas. The GAP believes only about 9 vessels will actively fish in this area. Enforcement Consultants notified GAP members that there may be increased costs to vessels fishing in this area associated with increased VMS “ping” rates. The GAP and affected industry members are willing to bear these increased costs to provide increased slope fishing opportunities.

PFMC
06/16/06

GROUNDFISH MANAGEMENT TEAM (GMT) REPORT ON 2007-08 GROUNDFISH MANAGEMENT MEASURES

Under Agenda Item F.2., the Council adopted a series of tentative overfished species OYs and provided the GMT and GAP with direction on developing management measures to keep the fishery within the OYs. Tribal fishery management measures were tentatively adopted under agenda item F.2. The Council also provided guidance on management measures for non-tribal fisheries under that agenda item. Each of the three states has developed a supplemental report on recreational fisheries management in 2007-2008 for this agenda item, F.6. The GMT reviewed these reports in draft and supports the management measures proposed therein as appropriate for keeping the recreational fisheries within Council-recommended harvest levels. Therefore, the remainder of this report focuses on catch-sharing issues and management measures for the non-tribal commercial fisheries. Any management measures not specifically adopted by the Council for revision in 2007-2008 would remain in place, as implemented via Federal regulation.

The tentative 2007-2008 overfished species OYs adopted under F.2. were:

	2007 OY	2008 OY
Bocaccio	218 mt	218 mt
Canary rockfish	44 mt	44 mt
Cowcod	4 mt	4 mt
Darkblotched rockfish	290 mt	290 mt
Pacific ocean perch	150 mt	150 mt
Widow rockfish	368 mt	368 mt
Yelloweye rockfish	23 mt	20 mt

The Council also adopted tentative recreational harvest guidelines for canary and yelloweye rockfish:

	2007 Recreational HGs	2008 Recreational HGs
Canary rockfish	8.2 mt – Washington/Oregon 9.0 mt – California	8.2 mt – Washington/Oregon 9.0 mt – California
Yelloweye rockfish	6.8 mt – Washington/Oregon 2.1 mt – California 1.5 mt – Sport residual	6.8 mt – Washington/Oregon 2.1 mt – California

These recreational harvest guidelines will be adopted in Federal regulations via the footnotes to the ABC/OY tables published in 50 CFR 660. As in past years, NMFS will also publish any estimated research catch, tribal allocations, recreational set-asides, open access allocations, and limited entry trawl and non-trawl allocations, as appropriate, in the footnotes to those tables. Unless otherwise previously designated by regulation, allocation scheme, or specified by the Council at this meeting, NMFS will use the values provided in Table 1, the bycatch scorecard for the Council's preferred alternative.

Black Rockfish Sharing Between Oregon and California

At its April meeting, the Council adopted a tentative black rockfish sharing framework for 2007-2008, which would need to be adopted under this agenda item to implement in 2007-2008. As in 2005-2006, carry forward the black rockfish catch sharing recommendation of 58% to Oregon and 42% to California within the southern OY, and specify those values as harvest guidelines in the federal regulations for the respective states. These percentages result in an Oregon harvest guideline of 419 mt (recreational and commercial harvest guidelines of 286.6-350.2 mt and 90.5-110.7 mt respectively) and a California harvest guideline of 303 mt. The states of California and Oregon have factored in precautionary approaches in managing to these black rockfish targets.

State Nearshore Management

Nearshore fisheries in Oregon and California are based on conservative management measures. Catches will be closely monitored inseason and trip limits will be adjusted via federal or state inseason action to avoid exceeding federal harvest guidelines or state harvest caps. In the event that new information indicates that the projected impacts to depleted species would be exceeded, the fishery may be adjusted using depth-based management tools where possible.

Oregon and Northern California

The GMT supports the ODFW and CDFG recommendation of Action Alternative 3b, described on p. 88 in Chapter 2 of the preliminary DEIS. This alternative provides for a near status quo fishery shoreward of 30 fathoms, and results in updated expected impacts for canary rockfish, widow rockfish, and yelloweye rockfish of 1.7, 0.1, and 2.1 mt, respectively. The fishery would operate for 12 months under federal and state harvest guidelines and federal trip limits (northern California) and state harvest caps and state trip limits (Oregon).

A 20-fathom open access RCA line is being added to the list of available inseason tools.

Central and Southern California

The GMT supports CDFG recommendation of Action Alternative 3b, described on p. 88 in Chapter 2 of the preliminary DEIS, along with increases to trip limits as provided in the Supplemental CDFG Report under this agenda item. The updated expected impacts to overfished species are 0.33 mt for canary rockfish and 0.0 mt for all other overfished species.

Depth- and area-based management

The GMT recommends adopting the following new RCA boundary lines for use in 2007-2008:

- Boundary lines off Washington approximating the 10, 20 and 25 fm depth contours.

- Boundary lines off Oregon approximating the 20 and 25 fm depth contours. The 25 fm depth contour boundary line would replace the line currently in Federal regulations for 27 fm.
- A boundary line off California approximating the 250 fm depth contour south of 38° N. lat., a 250 fm line modified to provide for petrale fishing areas south of 38° N. lat., and a 180 fm line modified to provide for petrale fishing areas.

In addition to adopting these particular new lines, the States and NMFS are working together to make corrections to existing RCA lines to ensure that: the lines better approximate the depth contours they are intended to represent; the petrale open areas are more consistent between the petrale-modified depth contour lines; and the lines that intersect with EFH conservation areas are compatible with the boundaries of those areas.

Limited Entry Trawl

The Council directed the GMT to draft management measures for the limited entry trawl fishery consistent with those provided in Table 2-22 (page 87) in the Preliminary DEIS, working under the tentative overfished species OYs and the OYs already adopted for non-overfished species. Draft trip limit tables for 2007-2008, including RCA boundaries, are provided as Table 3 for this report. The GMT also herein recommends additional new management measures for the whiting trawl fishery and for the non-whiting limited entry bottom trawl fishery.

Whiting fishery bycatch limits. The GMT discussed sector specific bycatch limits for the non-tribal whiting fishery and concluded that further analysis is needed before a recommendation can be made to the Council. Specifically, the GMT believes that an analysis needs to examine:

- Adequacy of using at-sea observer sample data to monitor sector bycatch limits for infrequently or rare occurring species
- Adequacy of a shore-based monitoring program for monitoring bycatch limits
- Timeliness of data for monitoring limits
- Appropriate bycatch limits for each non-tribal sector

The GMT does not believe that there is time to prepare an adequate analysis for the 2007-2008 management measures. However, the GMT does believe that an analysis could be completed in conjunction with the regulatory package that is being proposed for a monitoring program in the shore-based fishery. This package is proposed to be available to the Council in September, with an intended implementation in early 2007. At this time, the shore-based whiting fishery is operating under an EFP that provides for at-sea monitoring, but the future of a monitoring program for the shore-based whiting fishery is unknown. If the fishery reverts to sorting at sea, neither fleetwide nor sector bycatch limits could be adequately monitored.

The GMT recommends implementing placeholder fleet-wide annual overfished species bycatch limits for the non-tribal whiting fisheries in 2007 and 2008. The GMT plans to review these limits in early 2007 for their compatibility with the 2007 whiting OY:

- Canary rockfish, 4.7 mt
- Darkblotched rockfish, 25 mt
- Widow rockfish, 200 mt

Whiting fishery salmon bycatch prevention. During the 2005 fishery, when it became apparent that the 11,000 Chinook level specified in the Biological Opinion was going to be exceeded, NMFS defined an Ocean Salmon Conservation Zone (OSCZ) for all waters shoreward of a boundary line approximating the 100-fm (183-m) depth contour. Fishing for whiting during the remaining portion of the 2005 primary season was prohibited within the Ocean Salmon Conservation Zone.

For 2007 and beyond, automatic action authority could be established to implement an OSCZ for the whiting fishery if inseason response is needed to prevent high salmon take. When NMFS projects the catch of Chinook salmon in the Pacific whiting fishery will exceed the 11,000 fish threshold, the OSCZ could be put in place for all non-tribal sectors of the whiting fishery though a single Federal Register notice. Similarly, NMFS would consult with the Makah Tribe to enact area management to reduce Chinook salmon interactions. The GMT does not recommend beginning the whiting season with the OSCZ already in place, since an automatic closure in the nearshore area would move the whiting fleet offshore and closer to waters where darkblotched rockfish may be encountered. By allowing flexibility early in the season, whiting fleet participants may continue their past practice of sharing bycatch information with each other during the season to balance the various bycatch species that they must avoid in both nearshore and offshore waters.

Bottom trawl fishery salmon bycatch prevention. Estimates of Chinook salmon bycatch for the (non-whiting) limited entry bottom trawl fishery have only recently become available. WCGOP has estimated that 18,120 salmon caught in 2002, 13,862 fish in 2003, and 1,978 fish in 2004. Virtually all of the salmon caught were Chinook salmon. The 2006 supplemental biological opinion notes that “more bycatch, in the bottom trawl fishery in particular, was shifted south into northern California than was previously thought”. As a result, Sacramento winter-run Chinook, California coastal Chinook, and Central Valley spring-run Chinook may be disproportionately affected by the bottom trawl fishery. However, component ESUs for these stocks have increased or remained stable over the past 10 years.

There is considerable uncertainty about bycatch of salmon in the bottom trawl fishery. The magnitude and distribution of bycatch in the trawl fishery since 2002 has been affected by significant changes in management measures to protect overfished groundfish stocks and changes in fishing effort as a result of the trawl buyback program. The uncertainty will remain until more years of observer data are available and changes in groundfish fishery management and effort distribution are analyzed in relation to the incidental take of salmon. Once new data from the WCGOP becomes available, the GMT plans to look at ways of reducing salmon bycatch in the bottom trawl fishery to meet the concerns specified in the biological opinion.

Selective Flatfish Trawl Gear South of 40°10’ N. lat.

Selective flatfish trawl gear was implemented as a mandatory gear when fishing shoreward of the RCA in the area north of 40°10’ N. Lat in 2005. Implementation was delayed for areas further south in light of an ongoing EFP to measure bycatch rates of overfished species in that area. The GMT supported the potential implementation of the gear depending on the results from the EFP.

Participation in the EFP was low, and bycatch rate estimates for bocaccio and other overfished species in that area remain uncertain. However, bycatch reductions associated with this gear have been proven in the north, and it is expected that bycatch for canary rockfish will decrease in the south through the implementation of this gear. While bycatch rate reductions for bocaccio are also likely through the implementation of this gear, the GMT believes that expected canary rockfish bycatch reductions alone are sufficient to justify the implementation of this gear in order to reduce the bycatch of canary rockfish and to reduce the risk of early closure of the bottom trawl fishery. Therefore, the GMT recommends that selective flatfish gear be implemented as a requirement to fish shoreward of the RCA south of 40°10’ N. lat. Projected impacts for proposed trip limits contained in this report reflect the lower expected bycatch rate for canary rockfish. The projected canary mortality for the area south of 40°10’ N. Lat is 2.0 mt with selective gear, which represents a catch savings of approximately 0.5 mt over non-selective gear. The GMT notes that the bycatch scorecard (attached) reflects a residual amount of 0.8 mt after EFP set-asides are removed; this residual would be reduced to 0.3 mt under status quo gear.

Scottish Seine Gear Between 38° N. lat. and 36° N. lat.

Based on results from a three-year EFP study conducted by CDFG, the GMT considered a Scottish seine gear exemption from trawl RCA closures. This particular type of small footrope trawl gear was demonstrated to have lower bycatch rates of overfished species than more conventional trawl gear. This gear requires VMS and must adhere to declaration requirements to provide for enforcement of this exemption. The GMT continues to support the use of gears that reduce the bycatch rate of non-target species; however, the Team recommends that this exemption apply only to the area south of 38° N latitude and north of 36° N. lat., where low bycatch rates of overfished species were demonstrated. The GMT further recommends that this exemption be limited to depths less than 100 fm. This encompasses the primary flatfish target areas but reduces risk associated with the exemption. This gear will remain within the WCGOP pool, enabling the GMT to monitor bycatch rates into the future. If the Council chooses to adopt a Scottish seine exemption from RCA closures, the GMT recommends that enforcement be consulted in order to develop regulations that clearly define Scottish seine gear.

Darkblotched Rockfish Conservation Areas.

The GMT reviewed the CDFG proposal to establish two new Darkblotched Rockfish Conservation Areas in the area between 40°10’ N. lat and 38° N. Lat and recommends that two DRCAs be considered for use in 2007-08. These polygons are located where survey and logbook data analysis indicated higher catches of darkblotched rockfish than the surrounding area. However, the proposed DRCAs overlap important fishing grounds for the winter petrale fishery, and therefore the GMT recommends that, if adopted, they only apply in periods 2-5.

Slope rockfish target opportunities have been reduced substantially in recent years due to concerns over potential catches of darkblotched rockfish in this area. There is interest in restoring slope rockfish opportunities, however these opportunities are limited by the amount of darkblotched associated with slope rockfish. It is the GMT’s understanding that industry members were willing to support the proposed closures with the expectation that they would receive more slope rockfish opportunity as a result. Unfortunately, a full analysis of potential catch savings of darkblotched rockfish that might be assumed from these closures has not been completed at this time, although analysis to date will be provided in the DEIS. The GMT cautions against creating closed areas with the expectation of increasing limits until a thorough analysis can be conducted and reviewed to ensure that increased trip limits can be accommodated. It is our understanding that a supplemental NEPA analysis may be required to implement final DRCAs during 2007-08. The GMT requests that the Council direct the Team to evaluate possible bycatch reductions associated with the DRCAs.

Limited Entry Fixed Gear and Open Access

The Council directed the GMT to draft management measures for the limited entry fixed gear fishery consistent with those provided in Tables 2-8a and 2-8b (pages 40-42,) and for the open access fishery consistent with those provided in Tables 2-9a and 2-9b (pages 43-46) in the Preliminary DEIS, working under the tentative overfished species OYs and the OYs already adopted for non-overfished species. Draft trip limit tables for 2007-2008, including RCA boundaries, are provided in Tables 4 and 5 in this report.

The limited entry fixed gear primary sablefish fishery's tier limits for both 2007 and 2008 under the sablefish OYs adopted by the Council in April are: Tier 1, 48,500 lb; Tier 2, 22,000 lb; and Tier 3, 12,500 lb.

Lingcod in the Salmon Troll Fishery. At their March meeting, the GMT reviewed an analysis of an observer program conducted by WDFW in the Washington salmon troll fishery for the past 3 years. The analysis showed a strong increasing trend of incidental catch of lingcod, consistent with the recovery of the stock, over the period of the study. The catch rate in 2005 was one lingcod for every seven Chinook. Since lingcod retention was prohibited during this time, this catch is assumed to be entirely incidental. The Council included for analysis in the draft EIS a measure to allow an incidental allowance of lingcod in the salmon troll fishery north of 40°10' N. lat. of one lingcod for every 10 Chinook landed, not to exceed the open access lingcod cumulative limit. The team did express concern that, although the fleet-wide incidental catch ratio of lingcod in the northern troll fleet appears to be well within this ratio, some increased lingcod targeting could occur and potentially increase overfished rockfish bycatch. It was also noted that most lingcod released in the troll fishery survive.

Yelloweye Rockfish Conservation Areas. To constrain yelloweye rockfish incidental catch in the commercial hook-and-line fisheries, the GMT recommends adopting a new yelloweye rockfish conservation area that would apply to the limited entry and open access fixed gear fisheries. Within the Washington North Coast area, the area labeled North Coast Area B in the Preliminary DEIS (Chapter 2, Figure 2-8, p. 65) is bounded by the following coordinates:

> Beginning at 48°11.77' N lat., 125°13.03' W long.;
> Then to 48° 16.43' N lat., 125°07.55' W long.;
> Then to 48° 14.72' N lat., 125°01.84' W long.;
> Then to 48°13.36' N lat., 125°03.20' W long.;
> Then to 48°12.74' N lat., 125°05.83' W long.;
> Then to 48°11.55' N lat., 125°04.99' W long.;
> Then to 48°09.96' N lat., 125°06.63' W long.;
> Then to 48°09.68' N lat., 125°08.75' W long.;
> And back to the point of origin.

This area would be closed to commercial limited entry fixed gear and open access groundfish fishing. This area is already closed to trawl gear with the implementation of the trawl rockfish conservation area and the essential fish habitat trawl closure. Under salmon conservation measures in support of the Salmon FMP, most of this area is already closed to salmon troll as a salmon conservation measure.

To constrain yelloweye rockfish incidental catch in the salmon troll fishery, the GMT recommends adopting a new yelloweye rockfish conservation area. Within the Washington North Coast area in the Preliminary DEIS (Chapter 2, Figure 2-11, p. 69) bounded by the following coordinates:

> Beginning at 48°00.00’ N lat., 125°14.00’ W long.;
> Then to 48°02.00’ N lat., 125°14.00’ W long.;
> Then to 48°00.00’ N lat., 125°16.50’ W long.;
> Then to 48°02.00’ N lat., 125°16.50’ W long.;
> And back to the point of origin.

This area would be closed to the commercial salmon troll fishery. WDFW would like to point out that this area overlaps a portion of the “C-shaped” YRCA, and is already closed to recreational groundfish and halibut fishing.

<u>Cowcod Conservation Areas.</u> The most significant risk of altering the perimeters of the CCA is the possibility that incidental catches of cowcod and bocaccio would increase, either as a result of incidental catches at the boundary of the fathom lines, where cowcod tend to be rare, or from incidental catches resulting from inadvertent incursions of vessels or gear into shallower depth in the boundary lines. Although this risk is difficult to evaluate, observer data has shown no cowcod in fixed gear landings south of 40˚10’ N. lat. since the inception of the observer program. However, the steep and complex topography of the continental slope in these regions, the inference from the stock assessment that nearly two-thirds of the assessed (Conception area) cowcod biomass is found within the CCAs, and the corresponding complexity of the 175 fm line alternative considered here, would suggest some potential for increased bycatch.

The draft EIS suggested that changing the boundaries of the CCA could undermine the ability to replicate resource surveys within those boundaries, such as the submersible survey. The SSC has questioned whether this is true, based on their conclusion that the methodology used to expand the biomass estimate within the CCAs to the entire range of the stock would not be appropriate for future surveys. Consequently, this language will be removed from the Draft EIS. However, the GMT notes that there is limited observer coverage in this area, and is concerned about the ability to adequately monitor the consequences of changing the CCA boundaries. The GMT did not arrive at a consensus recommendation regarding this proposal, but recommends that the challenges associated with adequately monitoring the consequences of this decision be considered in making management decisions regarding this issue.

<u>Open Access Non-Groundfish Trawl</u>
The GMT recommends RCA boundaries for open access trawl fisheries be the same as limited entry trawl RCA lines, except that ridgeback prawn trawl is exempted to 100 fm when the inner boundary of the RCA is moved shallower than 100 fm.

Other Regulations

The GMT reviewed federal gear regulations and requirements at its May meeting to ensure that they are consistent with the intent of 2007-2008 management measures.

Chafing Gear Regulations The GMT recommends that NMFS revise chafing gear requirements in federal regulation. In 2003, when new chafing gear requirements were added for small footrope trawl gear, reference language regarding the chafing gear requirements for midwater trawl were inadvertently changed in the regulation. The GMT believes that the regulatory language should be revised such that the chafing gear requirements are reinstated for midwater trawl gear and maintained for small footrope trawl.

Lingcod size limit The GMT recommends setting lingcod size limits at 22 inches for Washington and Oregon recreational fisheries and limited entry fixed gear and open access commercial fisheries north of 42˚ N. lat., and remain at the status quo size limit of 24 inches for California recreational and commercial fisheries.

GMT Recommendations:

1. Adopt recreational fisheries management measures specified in ODFW and CDFG supplemental reports under this agenda item and the WDFW supplemental report under Agenda Item F.2
2. Adopt nearshore management measures for Oregon and California as recommended in ODFW and CDFG supplemental reports under this agenda item
3. Adopt proposed new RCA lines and revised RCA lines for use in 2007-08
4. Adopt limited entry trawl RCA boundaries and cumulative limits as shown in table 3
5. Adopt whiting bycatch limits (to be reconsidered inseason in March 2007)
6. Adopt the requirement to use selective flatfish trawl gear in the limited entry trawl fishery south of 40 degrees 10 minutes latitude when fishing groundfish bottom trawl gear in areas shoreward of the trawl RCA
7. Adopt open access and limited entry fixed gear RCA boundaries and cumulative limits as specified in tables 4 and 5
8. Adopt changes to open access non-groundfish trawl RCA boundaries as specified in GMT report
9. Consider changes to the Cowcod Conservation Area boundaries
10. Consider exempting Scottish seine gear from trawl RCA requirements in areas between 38 degrees North latitude and 36 degrees North latitude to a depth of 100 fm and task the GMT and EC to work on establishing a clear definition of Scottish seine gear
11. Adopt lingcod size limit change for commercial limited entry fixed gear and open access fisheries and recreational fisheries in Washington and Oregon
12. Adopt YRCAs

Table 1. Council Preferred Alternative: 2007-2008 Estimated Total Mortality (mt) a/

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Fishery	Bocaccio b/	Canary	Cowcod	Dkbl	POP	Widow	Y'eye '07	*Y'eye '08*
Limited Entry Trawl- Non-whiting	48.0	7.9	2.8	233.1	101.1	0.7	0.1	*0.1*
Limited Entry Trawl- Whiting								
At-sea whiting motherships					0.9		0.0	*0.0*
At-sea whiting cat-proc		4.7		25.0	2.8	200.0	0.0	*0.0*
Shoreside whiting					1.7		0.0	*0.0*
Tribal whiting		1.6		0.0	0.6	6.1	0.0	*0.0*
Tribal								
Midwater Trawl		1.8		0.0	0.0	40.0	0.0	*0.0*
Bottom Trawl		0.8		0.0	3.7	0.0	0.0	*0.0*
Troll		0.5		0.0	0.0		0.0	*0.0*
Fixed gear		0.3		0.0	0.0	0.0	2.3	*2.3*
Limited Entry Fixed Gear								
Sablefish	13.4	0.5	0.1	0.6	0.4	0.0	1.0	*1.0*
Non-Sablefish		0.2		0.4		0.5	1.3	*1.3*
Open Access: Directed Groundfish								
Sablefish DTL	0.0	0.1		0.2	0.1	0.0	0.3	*0.3*
Nearshore (North of 40°10' N. lat.)	0.0	1.7	0.1	0.0	0.0	0.1	2.1	2.1
Nearshore (South of 40°10' N. lat.)	0.0	0.3		0.0	0.0		0.0	0.0
Other	10.6	0.0		0.0	0.0	0.0	0.0	*0.0*
Open Access: Incidental Groundfish								
CA Halibut	0.1	0.1		0.0	0.0			
CA Gillnet c/	0.5			0.0	0.0	0.0		
CA Sheephead c/				0.0	0.0	0.0	0.0	*0.0*
CPS- wetfish c/	0.3							
CPS- squid d/								
Dungeness crab c/	0.0		0.0	0.0	0.0			
HMS c/		0.0	0.0	0.0				
Pacific Halibut c/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.1	0.1	*0.1*
Ridgeback prawn	0.1	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Salmon troll	0.2	2.0	0.0	0.0	0.0	0.3	0.5	*0.5*
Sea Cucumber	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*0.0*
Spot Prawn (trap)								
Recreational Groundfish e/								
WA		8.2					6.8	6.8
OR						1.1		
CA	66.3	9.0	0.3			8.3	2.1	*2.1*
Research: Includes NMFS trawl shelf-slope surveys, the IPHC halibut survey, and expected impacts from SRPs and LOAs.								
	3.0	3.0	0.1	3.8	3.6	3.0	3.0	*3.0*
Non-EFP Total	142.6	42.8	3.4	263.2	114.9	260.2	19.7	19.7
EFPs f/	6.9	0.4	0.1	0.4	0.0	3.6	0.1	
EFP Subtotal	6.9	0.4	0.1	0.4	0.0	3.6	0.1	0.0
TOTAL	149.5	43.2	3.5	263.6	114.9	263.8	19.8	*19.7*
Preferred OY alternative	**218**	**44.0**	**4.0**	**290**	**150**	**368**	**23**	**20**
Difference	68.5	0.8	0.5	26.4	35.1	104.2	3.2	*0.3*
Percent of OY	68.6%	98.2%	86.5%	90.9%	76.6%	71.7%	86.1%	*98.5%*
Key	(shaded) = either not applicable; trace amount (<0.01 mt); or not reported in available data sources.							

a/ The mortality in Incidental groundfish and tribal fisheries were held constant at 2006 scorecard values, with the exception of an increase in mortality of canary and yelloweye in the salmon troll fishery. Research take was adjusted based on April 2006.

b/ South of 40°10' N. lat.

c/ Mortality estimates are not hard numbers; based on the GMT's best professional judgment.

d/ Bycatch amounts by species unavailable, but bocaccio occurred in 0.1% of all port samples and other rockfish in another 0.1% of all port samples (and squid fisheries usually land their whole catch). In 2001, out of 84,000 mt total landings 1 mt was groundfish. This suggests that total bocaccio was caught in trace amounts.

e/ Values for canary rockfish and yelloweye rockfish represent specified harvest guidelines.

f/ Values are proposed EFP bycatch caps, not estimates of total mortality. The EFP is terminated inseason if the cap is projected to be attained early. There is no EFP set-aside for yelloweye rockfish in 2008.

Table 3 (North) to Part 660, Subpart G -- 2006 Trip Limits for Limited Entry Trawl Gear North of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

62006

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]: North of 40°10' N. lat.	75 fm - modified 250 fm [7/]	75 fm - 250 fm	75 fm - 200 fm	100 fm - 200 fm	75 fm - 200 fm	75 fm - modified 250 fm [7/]

Selective flatfish trawl gear is required shoreward of the RCA; all trawl gear (large footrope, selective flatfish trawl, and small footrope trawl gear) is permitted seaward of the RCA. Midwater trawl gear is permitted only for vessels participating in the primary whiting season.

See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).

State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
1	**Minor slope rockfish[2/] & Darkblotched rockfish**	4,000 lb/ 2 months					
2	**Pacific ocean perch**	3,000 lb/ 2 months					
3	**DTS complex**						
4	Sablefish						
5	large & small footrope gear	13,000 lb/ 2 months		15,000 lb/ 2 months			13,000 lb/ 2 months
6	selective flatfish trawl gear	5,000 lb/ 2 months	8,000 lb/ 2 months				5,000 lb/ 2 months
7	multiple bottom trawl gear [8/]	5,000 lb/ 2 months	8,000 lb/ 2 months				5,000 lb/ 2 months
8	Longspine thornyhead						
9	large & small footrope gear	22,000 lb/ 2 months					
10	selective flatfish trawl gear	3,000 lb/ 2 months					
11	multiple bottom trawl gear [8/]	3,000 lb/ 2 months					
12	Shortspine thornyhead						
13	large & small footrope gear	7,500 lb/ 2 months					
14	selective flatfish trawl gear	3,000 lb/ 2 months					
15	multiple bottom trawl gear [8/]	3,000 lb/ 2 months					
16	Dover sole						
17	large & small footrope gear	80,000 lb/ 2 months		60,000 lb/ 2 months			80,000 lb/ 2 months
18	selective flatfish trawl gear	40,000 lb/ 2 months					
19	multiple bottom trawl gear [8/]	40,000 lb/ 2 months					

TABLE 3 (North)

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Table 3 (North). Continued

20	**Flatfish** (except Dover sole)						
21	Other flatfish [3/], English sole & Petrale sole						
22	large & small footrope gear for Other flatfish[3/] & English sole	110,000 lb/ 2 months	110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole.				110,000 lb/ 2 months
23	large & small footrope gear for Petrale sole	80,000 lb/ 2 months					80,000 lb/ 2 months
24	selective flatfish trawl gear for Other flatfish[3/] & English sole	90,000 lb/ 2 months, no more than 16,000 lb/ 2 months of which may be petrale sole.	90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole.				90,000 lb/ 2 months, no more than 16,000 lb/ 2 months of which may be petrale sole.
25	selective flatfish trawl gear for Petrale sole						
26	multiple bottom trawl gear [8/]	90,000 lb/ 2 months, no more than 16,000 lb/ 2 months of which may be petrale sole.	90,000 lb/ 2 months, no more than 25,000 lb/ 2 months of which may be petrale sole.				90,000 lb/ 2 months, no more than 16,000 lb/ 2 months of which may be petrale sole.
27	Arrowtooth flounder						
28	large & small footrope gear	100,000 lb/ 2 months					
29	selective flatfish trawl gear	90,000 lb/ 2 months					
30	multiple bottom trawl gear [8/]	90,000 lb/ 2 months					
31	**Whiting**						
32	midwater trawl	Before the primary whiting season: CLOSED -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED					
33	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip -- During the primary season: 10,000 lb/trip -- After the primary whiting season: 10,000 lb/trip					
34	**Minor shelf rockfish[1/], Shortbelly, Widow & Yelloweye rockfish**						
35	midwater trawl for Widow rockfish	Before the primary whiting season: CLOSED -- During primary whiting season: In trips of at least 10,000 lb of whiting, combined widow and yellowtail limit of 500 lb/ trip, cumulative widow limit of 1,500 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED					
36	large & small footrope gear	300 lb/ 2 months					
37	selective flatfish trawl gear	300 lb/ month		1,000 lb/ month, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month
38	multiple bottom trawl gear [8/]	300 lb/ month		300 lb/ 2 months, no more than 200 lb/ month of which may be yelloweye rockfish			300 lb/ month

TABLE 3 (North) con't

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Table 3 (North). Continued

39	**Canary rockfish**			
40	large & small footrope gear	CLOSED		
41	selective flatfish trawl gear	100 lb/ month	300 lb/ month	100 lb/ month
42	multiple bottom trawl gear 8/	CLOSED		
43	**Yellowtail**			
44	midwater trawl	Before the primary whiting season: CLOSED -- During primary whiting season: In trips of at least 10,000 lb of whiting: combined widow and yellowtail limit of 500 lb/ trip, cumulative yellowtail limit of 2,000 lb/ month. Mid-water trawl permitted in the RCA. See §660.373 for primary whiting season and trip limit details. -- After the primary whiting season: CLOSED		
45	large & small footrope gear	300 lb/ 2 months		
46	selective flatfish trawl gear	2,000 lb/ 2 months		
47	multiple bottom trawl gear 8/	300 lb/ 2 months		
48	**Minor nearshore rockfish & Black rockfish**			
49	large & small footrope gear	CLOSED		
50	selective flatfish trawl gear	300 lb/ month		
51	multiple bottom trawl gear 8/	CLOSED		
52	**Lingcod** 4/			
53	large & small footrope gear	1,200 lb/ 2 months		
54	selective flatfish trawl gear			
55	multiple bottom trawl gear 8/			
56	**Pacific cod**	30,000 lb/ 2 months	70,000 lb/ 2 months	30,000 lb/ 2 months
57	**Spiny dogfish**	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months
58	**Other Fish** 5/	Not limited		

TABLE 3 (North) con't

1/ Bocaccio, chilipepper and cowcod are included in the trip limits for minor shelf rockfish.
2/ Splitnose rockfish is included in the trip limits for minor slope rockfish.
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 250 fm" line is modified to exclude certain petrale sole areas from the RCA.
8/ If a vessel has both selective flatfish gear and large or small footrope gear on board during a cumulative limit period (either simultaneously or successively), the most restrictive cumulative limit for any gear on board during the cumulative limit period applies for the entire cumulative limit period.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

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Table 3 (South) to Part 660, Subpart G -- 2006 Trip Limits for Limited Entry Trawl Gear South of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

62006

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
	40°10' - 38° N. lat.	100 fm - modified 200 fm [7/]	100 fm - 150 fm				100 fm - modified 200 fm [7/]
	38° - 34°27' N. lat.	100 fm - 150 fm					
	South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands					

Selective flatfish trawl gear is required shoreward of the RCA; all trawl gear (large footrope, selective flatfish trawl, and small footrope trawl gear) is permitted seaward of the RCA.

See § 660.370 and § 660.381 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).

State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
1	**Minor slope rockfish**[2/] **& Darkblotched rockfish**						
2	40°10' - 38° N. lat.	15,000 lb/ 2 months			10,000 lb/ 2 months		15,000 lb/ 2 months
3	South of 38° N. lat.	40,000 lb/ 2 months					
4	**Splitnose**						
5	40°10' - 38° N. lat.	15,000 lb/ 2 months			10,000 lb/ 2 months		15,000 lb/ 2 months
6	South of 38° N. lat.	40,000 lb/ 2 months					
7	**DTS complex**						
8	Sablefish	14,000 lb/ 2 months					
9	Longspine thornyhead	22,000 lb/ 2 months					
10	Shortspine thornyhead	7,500 lb/ 2 months					
11	Dover sole	70,000 lb/ 2 months					
12	**Flatfish** (except Dover sole)						
13	Other flatfish[3/] & English sole						
14	40°10' - 38° N. lat.	110,000 lb/ 2 months	Other flatfish, English sole & Petrale sole: 110,000 lb/ 2 months, no more than 30,000 lb/ 2 months of which may be petrale sole.				110,000 lb/ 2 months
15	South of 38° N. lat.						
16	Petrale sole	80,000 lb/ 2 months					80,000 lb/ 2 months

TABLE 3 (South)

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Table 3 (South). Continued

17	Arrowtooth flounder			
18	40°10' - 38° N. lat.	10,000 lb/ 2 months		
19	South of 38° N. lat.			
20	**Whiting**			
21	midwater trawl	Before the primary whiting season: CLOSED -- During the primary season: mid-water trawl permitted in the RCA. See §660.373 for season and trip limit details. -- After the primary whiting season: CLOSED		
22	large & small footrope gear	Before the primary whiting season: 20,000 lb/trip -- During the primary season: 10,000 lb/trip - After the primary whiting season: 10,000 lb/trip		
23	**Minor shelf rockfish[1/], Chilipepper, Shortbelly, Widow, & Yelloweye rockfish**			
24	large footrope or midwater trawl for Minor shelf rockfish & Shortbelly	300 lb/ month		
25	large footrope or midwater trawl for Chilipepper	2,000 lb/ 2 months	12,000 lb/ 2 months	8,000 lb/ 2 months
26	large footrope or midwater trawl for Widow & Yelloweye	CLOSED		
27	small footrope trawl for Minor Shelf, Shortbelly, Widow & Yelloweye	300 lb/ month		
28	small footrope trawl for Chilipepper	500 lb/ month		
29	**Bocaccio**			
30	large footrope or midwater trawl	300 lb/ 2 months		
31	small footrope trawl	CLOSED		
32	**Canary rockfish**			
33	large footrope or midwater trawl	CLOSED		
34	small footrope trawl	100 lb/ month	300 lb/ month	100 lb/ month
35	**Cowcod**	CLOSED		
36	**Minor nearshore rockfish & Black rockfish**			
37	large footrope or midwater trawl	CLOSED		
38	small footrope trawl	300 lb/ month		
39	**Lingcod[4/]**			
40	large footrope or midwater trawl	1,200 lb/ 2 months		
41	small footrope trawl			
42	**Pacific cod**	30,000 lb/ 2 months	70,000 lb/ 2 months	30,000 lb/ 2 months
43	**Spiny dogfish**	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months
44	**Other Fish[5/] & Cabezon**	Not limited		

TABLE 3 (South) con't

1/ Yellowtail is included in the trip limits for minor shelf rockfish.
2/ POP is included in the trip limits for minor slope rockfish
3/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ Other fish are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
7/ The "modified 200 fm" line is modified to exclude certain petrale sole areas from the RCA.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

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Table 4 (North) to Part 660, Subpart G -- 2006 Trip Limits for Limited Entry Fixed Gear North of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table 62006

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)6/:						
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
	See § 660.370 and § 660.382 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish 2/ & Darkblotched rockfish**	4,000 lb/ 2 months					
2	**Pacific ocean perch**	1,800 lb/ 2 months					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months					
4	**Longspine thornyhead**	10,000 lb/ 2 months					
5	**Shortspine thornyhead**	2,000 lb/ 2 months					
6	**Dover sole**	5,000 lb/ month South of 42° N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.					
7	**Arrowtooth flounder**						
8	**Petrale sole**						
9	**English sole**						
10	**Other flatfish 1/**						
11	**Whiting**	10,000 lb/ trip					
12	**Minor shelf rockfish 2/, Shortbelly, Widow, & Yellowtail rockfish**	200 lb/ month					
13	**Canary rockfish**	CLOSED					
14	**Yelloweye rockfish**	CLOSED					
15	**Minor nearshore rockfish & Black rockfish**						
16	North of 42° N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish 3/					
17	42° - 40°10' N. lat.	6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish 3/					
18	**Lingcod 4/**	CLOSED		800 lb/ 2 months			CLOSED
19	**Pacific cod**	1,000 lb/ 2 months					
20	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2 months	100,000 lb/ 2 months		
21	**Other fish 5/**	Not limited					

TABLE 4 (North)

1/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
2/ Bocaccio, chilipepper and cowcod are included in the trip limits for minor shelf rockfish and splitnose rockfish is included in the trip limits for minor slope rockfish.
3/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lb or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.
4/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

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Table 4 (South) to Part 660, Subpart G -- 2006 Trip Limits for Limited Entry Fixed Gear South of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table 62006

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					
	See § 660.370 and § 660.382 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[2/] & Darkblotched rockfish**	40,000 lb/ 2 months					
2	**Splitnose**	40,000 lb/ 2 months					
3	**Sablefish**						
4	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 5,000 lb/ 2 months					
5	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
6	**Longspine thornyhead**	10,000 lb / 2 months					
7	**Shortspine thornyhead**	2,000 lb/ 2 months					
8	**Dover sole**	5,000 lb/ month South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.					
9	**Arrowtooth flounder**						
10	**Petrale sole**						
11	**English sole**						
12	**Other flatfish[1/]**						
13	**Whiting**	10,000 lb/ trip					
14	**Minor shelf rockfish[2/], Shortbelly, & Widow rockfish**						
15	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED	200 lb/ 2 months		300 lb/ 2 months	
16	South of 34°27' N. lat.	3,000 lb/ 2 months					
17	**Chilipepper rockfish**	2,000 lb/ 2 months, this opportunity only available seaward of the nontrawl RCA					
18	**Canary rockfish**	CLOSED					
19	**Yelloweye rockfish**	CLOSED					
20	**Cowcod**	CLOSED					
21	**Bocaccio**						
22	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED	100 lb/ 2 months	300 lb/ 2 months		
23	South of 34°27' N. lat.	300 lb/ 2 months		300 lb/ 2 months			
24	**Minor nearshore rockfish & Black rockfish**						
25	Shallow nearshore	300 lb/ 2 months	CLOSED	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
26	Deeper nearshore						
27	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED	500 lb/ 2 months		400 lb/ 2 months	500 lb/ 2 months
28	South of 34°27' N. lat.			600 lb/ 2 months			400 lb/ 2 months
29	California scorpionfish	300 lb/ 2 months	CLOSED	300 lb/ 2 months	400 lb/ 2 months		300 lb/ 2 months

TABLE 4 (South)

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Table 4 (South). Continued

30	**Lingcod**[3/]	CLOSED	800 lb/ 2 months		CLOSED	
31	**Pacific cod**	1,000 lb/ 2 months				
32	**Spiny dogfish**	200,000 lb/ 2 months	150,000 lb/ 2 months	100,000 lb/ 2 months		
33	**Other fish**[4/] **& Cabezon**	Not limited				

1/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
2/ POP is included in the trip limits for minor slope rockfish. Yellowtail is included in the trip limits for minor shelf rockfish.
3/ The minimum size limit for lingcod is 24 inches (61 cm) total length.
4/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
5/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

Table 5 (North) to Part 660, Subpart G -- 2006 Trip Limits for Open Access Gears North of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table

62006

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[6/]:						
	North of 46°16' N. lat.	shoreline - 100 fm					
	46°16' N. lat. - 40°10' N. lat.	30 fm - 100 fm					
	See § 660.370 and § 660.383 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).						
	State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.						
1	**Minor slope rockfish[1/] & Darkblotched rockfish**	Per trip, no more than 25% of weight of the sablefish landed					
2	**Pacific ocean perch**	100 lb/ month					
3	**Sablefish**	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 3,000 lb/ 2 months					
4	**Thornyheads**	CLOSED					
5	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.					
6	**Arrowtooth flounder**						
7	**Petrale sole**						
8	**English sole**						
9	**Other flatfish[2/]**						
10	**Whiting**	300 lb/ month					
11	**Minor shelf rockfish[1/], Shortbelly, Widow, & Yellowtail rockfish**	200 lb/ month					
12	**Canary rockfish**	CLOSED					
13	**Yelloweye rockfish**	CLOSED					
14	**Minor nearshore rockfish & Black rockfish**						
15	North of 42° N. lat.	5,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
16	42° - 40°10' N. lat.	6,000 lb/ 2 months, no more than 1,200 lb of which may be species other than black or blue rockfish [3/]					
17	**Lingcod[4/]**	CLOSED		400 lb/ month			CLOSED
18	**Pacific cod**	1,000 lb/ 2 months					
19	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2 months	100,000 lb/ 2 months		
20	**Other Fish[5/]**	Not limited					

TABLE 5 (North)

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21	**PINK SHRIMP NON-GROUNDFISH TRAWL** *(not subject to RCAs)*	
22	North	**Effective April 1 - October 31:** groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/month (minimum 24 inch size limit); sablefish 2,000 lb/month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.
23	**SALMON TROLL**	
24	North	Salmon trollers may retain and land up to 1 lb of yellowtail rockfish for every 2 lbs of salmon landed, with a cumulative limit of 200 lb/month, both within and outside of the RCA. This limit is within the 200 lb per month combined limit for minor shelf rockfish, widow rockfish and yellowtail rockfish, and not in addition to that limit. All groundfish species are subject to the open access limits, seasons and RCA restrictions listed in the table above.

1/ Bocaccio, chilipepper and cowcod rockfishes are included in the trip limits for minor shelf rockfish. Splitnose rockfish is included in the trip limits for minor slope rockfish.
2/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
3/ For black rockfish north of Cape Alava (48°09.50' N. lat.), and between Destruction Is. (47°40' N. lat.) and Leadbetter Pnt. (46°38.17' N. lat.), there is an additional limit of 100 lbs or 30 percent by weight of all fish on board, whichever is greater, per vessel, per fishing trip.
4/ The size limit for lingcod is 24 inches (61 cm) total length.
5/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling. Cabezon is included in the trip limits for "other fish."
6/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.

To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

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Table 5 (South) to Part 660, Subpart G -- 2006 Trip Limits for Open Access Gears South of 40°10' N. Lat.

Other Limits and Requirements Apply -- Read § 660.301 - § 660.390 before using this table 62006

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
	Rockfish Conservation Area (RCA)[5/]:						
	40°10' - 34°27' N. lat.	30 fm - 150 fm		20 fm - 150 fm		30 fm - 150 fm	
	South of 34°27' N. lat.	60 fm - 150 fm (also applies around islands)					

See § 660.370 and § 660.383 for Additional Gear, Trip Limit, and Conservation Area Requirements and Restrictions. See §§ 660.390-660.394 for Conservation Area Descriptions and Coordinates (including RCAs, YRCA, CCAs, Farallon Islands, and Cordell Banks).

State trip limits may be more restrictive than federal trip limits, particularly in waters off Oregon and California.

		JAN-FEB	MAR-APR	MAY-JUN	JUL-AUG	SEP-OCT	NOV-DEC
1	**Minor slope rockfish[1/] & Darkblotched rockfish**						
2	40°10' - 38° N. lat.	Per trip, no more than 25% of weight of the sablefish landed					
3	South of 38° N. lat.	10,000 lb/ 2 months					
4	**Splitnose**	200 lb/ month					
5	**Sablefish**						
6	40°10' - 36° N. lat.	300 lb/ day, or 1 landing per week of up to 1,000 lb, not to exceed 3,000 lb/ 2 months					
7	South of 36° N. lat.	350 lb/ day, or 1 landing per week of up to 1,050 lb					
8	**Thornyheads**						
9	40°10' - 34°27' N. lat.	CLOSED					
10	South of 34°27' N. lat.	50 lb/ day, no more than 1,000 lb/ 2 months					
11	**Dover sole**	3,000 lb/month, no more than 300 lb of which may be species other than Pacific sanddabs. South of 42o N. lat., when fishing for "other flatfish," vessels using hook-and-line gear with no more than 12 hooks per line, using hooks no larger than "Number 2" hooks, which measure 11 mm (0.44 inches) point to shank, and up to two 1 lb (0.45 kg) weights per line are not subject to the RCAs.					
12	**Arrowtooth flounder**						
13	**Petrale sole**						
14	**English sole**						
15	**Other flatfish**[2/]						
16	**Whiting**	300 lb/ month					
17	**Minor shelf rockfish[1/], Shortbelly, Widow & Chilipepper rockfish**						
18	40°10' - 34°27' N. lat.	300 lb/ 2 months	CLOSED	200 lb/ 2 months		300 lb/ 2 months	
19	South of 34°27' N. lat.	750 lb/ 2 months					
20	**Canary rockfish**	CLOSED					
21	**Yelloweye rockfish**	CLOSED					
22	**Cowcod**	CLOSED					
23	**Bocaccio**						
24	40°10' - 34°27' N. lat.	200 lb/ 2 months	CLOSED	100 lb/ 2 months		200 lb/ 2 months	
25	South of 34°27' N. lat.	100 lb/ 2 months		100 lb/ 2 months			

TABLE 5 (South)

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Table 5 (South). Continued

26	**Minor nearshore rockfish & Black rockfish**						
27	Shallow nearshore	300 lb/ 2 months	CLOSED	500 lb/ 2 months	600 lb/ 2 months	500 lb/ 2 months	300 lb/ 2 months
28	Deeper nearshore						
29	40°10' - 34°27' N. lat.	500 lb/ 2 months	CLOSED	500 lb/ 2 months		400 lb/ 2 months	500 lb/ 2 months
30	South of 34°27' N. lat.			600 lb/ 2 months			400 lb/ 2 months
31	California scorpionfish	300 lb/ 2 months	CLOSED	300 lb/ 2 months	400 lb/ 2 months		300 lb/ 2 months
32	**Lingcod**[3/]	CLOSED		400 lb/ month, when nearshore open			CLOSED
33	**Pacific cod**	1,000 lb/ 2 months					
34	**Spiny dogfish**	200,000 lb/ 2 months		150,000 lb/ 2 months	100,000 lb/ 2 months		
35	**Other Fish**[4/] **& Cabezon**	Not limited					
36	**RIDGEBACK PRAWN AND, SOUTH OF 38°57.50' N. LAT., CA HALIBUT AND SEA CUCUMBER NON-GROUNDFISH TRAWL**						
37	**NON-GROUNDFISH TRAWL Rockfish Conservation Area (RCA) for CA Halibut, Sea Cucumber & Ridgeback Prawn:**						
38	40°10' - 38° N. lat.	100 fm - modified 200 fm [7/]	100 fm - 150 fm				100 fm - modified 200 fm [7/]
39	38° - 34°27' N. lat.	100 fm - 150 fm					
40	South of 34°27' N. lat.	100 fm - 150 fm along the mainland coast; shoreline - 150 fm around islands					
41		Groundfish 300 lb/trip. Trip limits in this table also apply and are counted toward the 300 lb groundfish per trip limit. The amount of groundfish landed may not exceed the amount of the target species landed, except that the amount of spiny dogfish landed may exceed the amount of target species landed. Spiny dogfish are limited by the 300 lb/trip overall groundfish limit. The daily trip limits for sablefish coastwide and thornyheads south of Pt. Conception and the overall groundfish "per trip" limit may not be multiplied by the number of days of the trip. Vessels participating in the California halibut fishery south of 38°57'30" N. lat. are allowed to (1) land up to 100 lb/day of groundfish without the ratio requirement, provided that at least one California halibut is landed and (2) land up to 3,000 lb/month of flatfish, no more than 300 lb of which may be species other than Pacific sanddabs, sand sole, starry flounder, rock sole, curlfin sole, or California scorpionfish (California scorpionfish is also subject to the trip limits and closures in line 31).					
42	**PINK SHRIMP NON-GROUNDFISH TRAWL GEAR** *(not subject to RCAs)*						
43	South	**Effective April 1 - October 31:** Groundfish 500 lb/day, multiplied by the number of days of the trip, not to exceed 1,500 lb/trip. The following sublimits also apply and are counted toward the overall 500 lb/day and 1,500 lb/trip groundfish limits: lingcod 300 lb/ month (minimum 24 inch size limit); sablefish 2,000 lb/ month; canary, thornyheads and yelloweye rockfish are PROHIBITED. All other groundfish species taken are managed under the overall 500 lb/day and 1,500 lb/trip groundfish limits. Landings of these species count toward the per day and per trip groundfish limits and do not have species-specific limits. The amount of groundfish landed may not exceed the amount of pink shrimp landed.					

TABLE 5 (South) con't

1/ Yellowtail rockfish is included in the trip limits for minor shelf rockfish and POP is included in the trip limits for minor slope rockfish.
2/ "Other flatfish" are defined at § 660.302 and include butter sole, curlfin sole, flathead sole, Pacific sanddab, rex sole, rock sole, sand sole, and starry flounder.
3/ The size limit for lingcod is 24 inches (61 cm) total length.
4/ "Other fish" are defined at § 660.302 and include sharks, skates, ratfish, morids, grenadiers, and kelp greenling.
5/ The Rockfish Conservation Area is a gear and/or sector specific closed area generally described by depth contours but specifically defined by lat/long coordinates set out at § 660.390.
6/ The "modified 200 fm" line is modified to exclude certain petrale sole areas from the RCA.
To convert pounds to kilograms, divide by 2.20462, the number of pounds in one kilogram.

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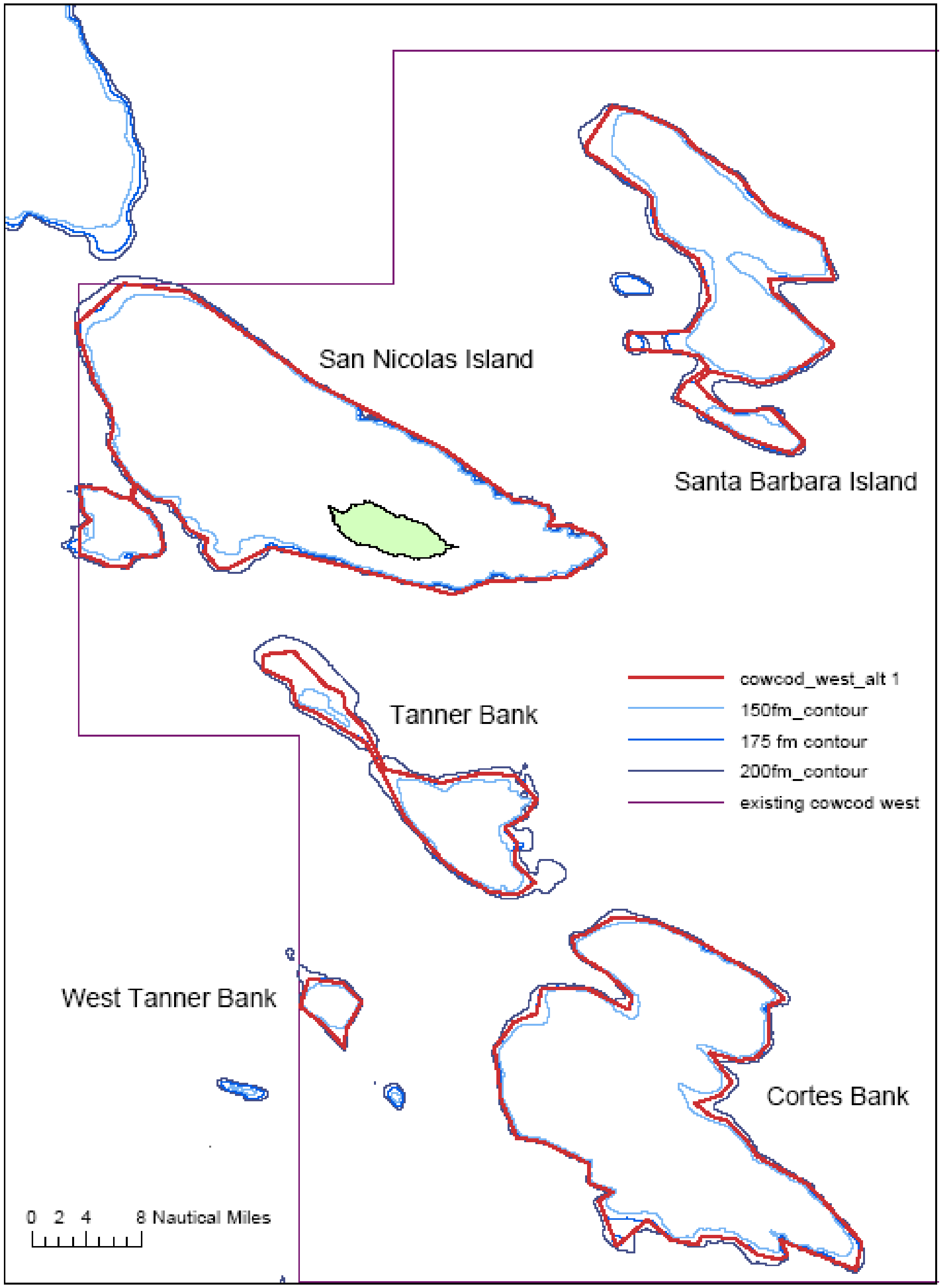
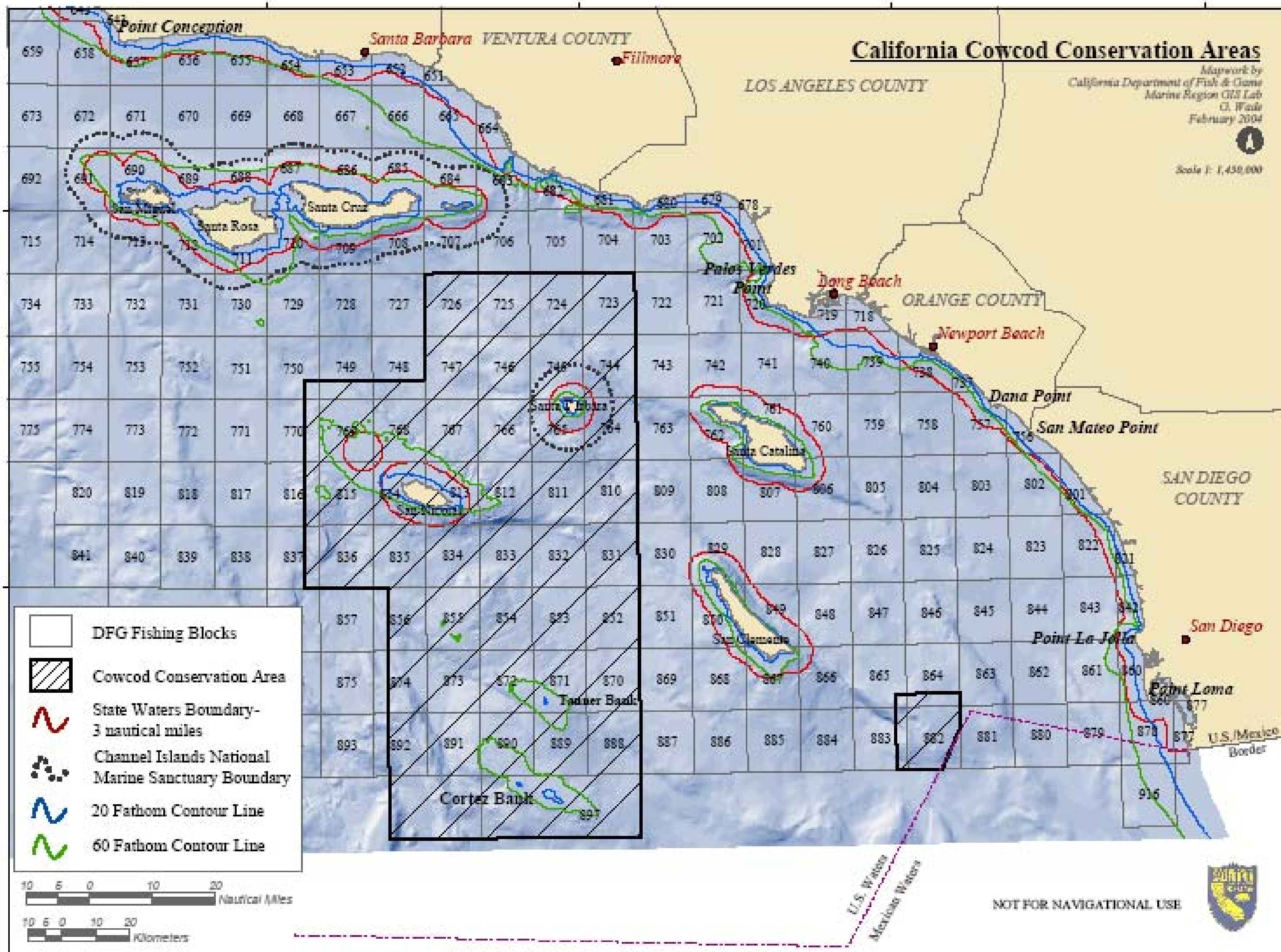
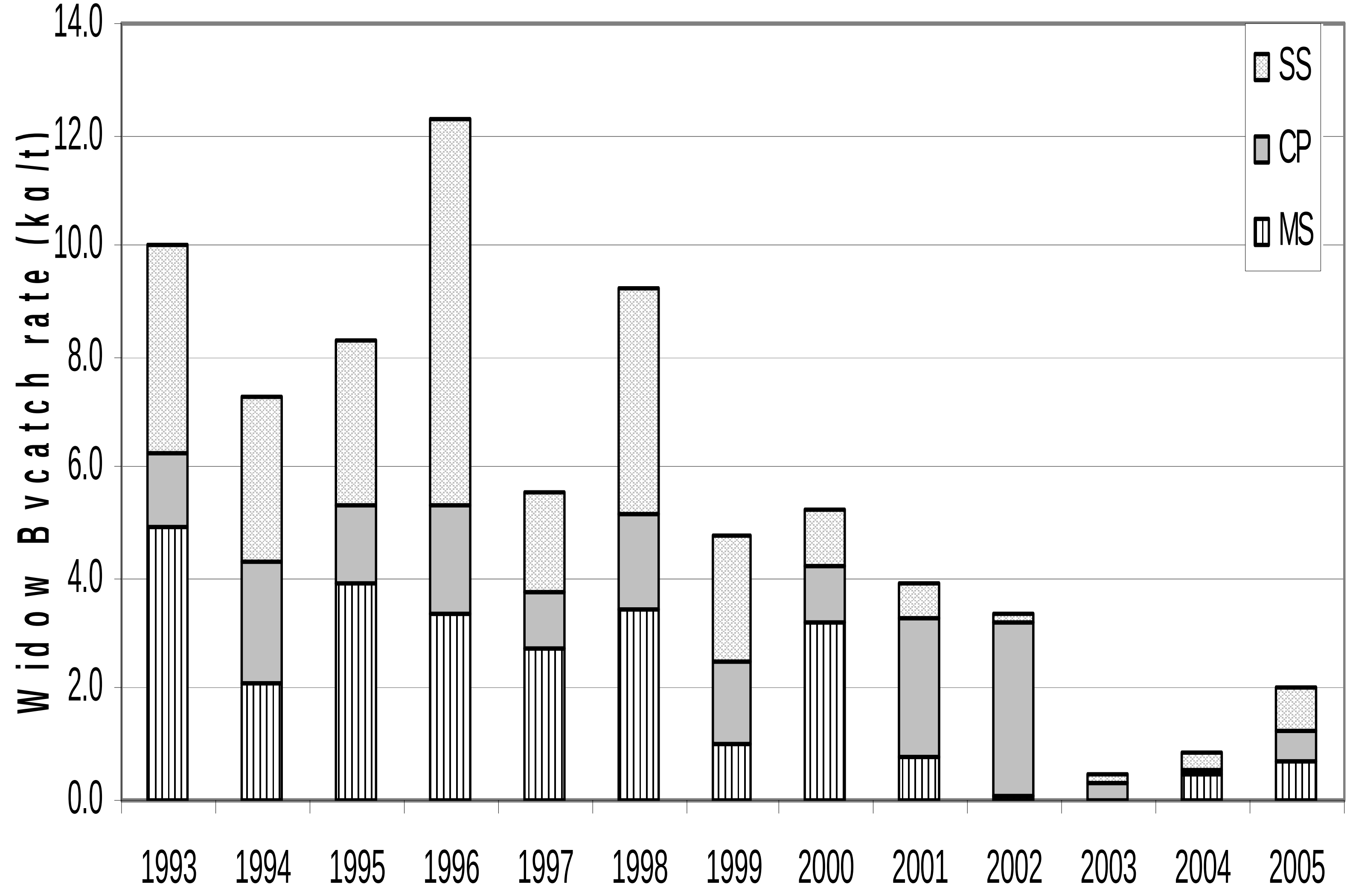
Agenda Item F.6.d
Supplemental PPT Presentation
(Public Comment Tim Athens)
June 2006

Cowcod West, Alternative 2, 175 fm Contour




California Cowcod Conservation Areas
Mapwork by
California Department of Fish & Game
Marine Region GIS Lab
O. Wade
February 2004
Scale 1: 1,450,000
Point Conception
Santa Barbara
VENTURA COUNTY
Fillmore
LOS ANGELES COUNTY
Santa Cruz
Santa Rosa
San Miguel
Palos Verdes Point
Long Beach
ORANGE COUNTY
Newport Beach
Dana Point
San Mateo Point
SAN DIEGO COUNTY
Santa Barbara
Santa Catalina
San Nicolas
San Clemente
Tanner Bank
Cortez Bank
Point La Jolla
San Diego
Point Loma
U.S./Mexico Border
U.S. Waters
Mexican Waters
DFG Fishing Blocks
Cowcod Conservation Area
State Waters Boundary- 3 nautical miles
Channel Islands National Marine Sanctuary Boundary
20 Fathom Contour Line
60 Fathom Contour Line
Nautical Miles
Kilometers
NOT FOR NAVIGATIONAL USE

Agenda Item F.6.d
Supplemental PPT Presentation
(Public Comment Vidar Westepad)
June 2006



	Whiting	Widow Rockfish						
	OY	Harvest	Allowable		Prerecruit Survey Widow index			
Year		Guideline	Biological Catch	Landings	NMFS	NMFS/ PWCC	Harvest Rate	Depletion
1987					424			
1989		12100	12400	12486	13			
1990	196,000	12400	8900	10222	296		0.1539	47.7
1991	228,000	7000	7000	6331	623		0.105	45.1
1992	208,800	7000	7000	6051	1		0.1098	43.6
1993	142,000	7000	7000	8235	101		0.1623	41.5
1994	260,000	6500	6500	6384	24		0.1391	38.3
1995	178,400	6500	7700	6703	25		0.1582	36
1996	212,000	6500	7700	6072	-		0.1451	34.1
1997	232,000	6500	7700	6492	49		0.1412	33.5
1998	232,000	5090	5750	3955	1		0.0849	33.2
1999	232,000	5090	5750	3943	81		0.0886	33.5
2000	232,000	5090	5750	3813	80		0.0926	32.9
2001	190,400	2300	3727	1812	193	61	0.0492	31.6
2002	129,600	856	3727	276	858	1393	0.0082	30.7
2003	148,200	832	3871	28	227	68	0.0009	30.6
2004	250,000	284	3460	73	1,248	758	0.002	31.1
2005	269,069	284	3460	156		61		
2006	269,069	284	3460					
2007	300,541							
2008	327,029							

	Whiting	Widow_Rockfish						
	OY	Harvest	Allowable		Prerecruit Survey Widow index			
Year		Guideline	Biological Catch	Landings	NMFS	NMFS/ PWCC	Harvest Rate	Depletion
1988					257			
1989		12100	12400	12486	13			
1990	196,000	12400	8900	10222	296		0.1539	47.7
1991	228,000	7000	7000	6331	623		0.105	45.1
1992	208,800	7000	7000	6051	1		0.1098	43.6
1993	142,000	7000	7000	8235	101		0.1623	41.5
1994	260,000	6500	6500	6384	24		0.1391	38.3
1995	178,400	6500	7700	6703	25		0.1582	36
1996	212,000	6500	7700	6072	-		0.1451	34.1
1997	232,000	6500	7700	6492	49		0.1412	33.5
1998	232,000	5090	5750	3955	1		0.0849	33.2
1999	232,000	5090	5750	3943	81		0.0886	33.5
2000	232,000	5090	5750	3813	80		0.0926	32.9
2001	190,400	2300	3727	1812	193	61	0.0492	31.6
2002	129,600	856	3727	276	858	1393	0.0082	30.7
2003	148,200	832	3871	28	227	68	0.0009	30.6
2004	250,000	284	3460	73	1,248	758	0.002	31.1
2005	269,069	284	3460	156		61		
2006	269,069	284	3460					
2007	300,541							
2008	327,029							

CALIFORNIA DEPARTMENT OF FISH AND GAME MOTION ON THE ADOPTION OF THE 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/ MANAGEMENT MEASURES

For the 2007-2008, CDFG recommends that the Council adopt the following management measures for 2007-2008 that will keep harvests within recreational harvest targets for rebuilding and target species. California proposes maintaining the five regions described under the No Action Alternative to manage California recreational groundfish fisheries provided in Agenda Item F.6.b Supplemental CDFG Report on "Corrections to California Recreational Alternatives in Chapter 2.0 of the 2007-2008 Groundfish Management Specifications Draft EIS".

The status quo (No Action) California recreational management measures that continue to apply include the following:

- Regulations apply to groundfish (with sanddab fishery exception) and associated state-managed species (rock greenling, California sheephead, and ocean whitefish).
- The sport fishery for sanddabs, using gear specified in federal and state regulations (size #2 hooks or smaller), is exempt from the season closures and depth restrictions placed on other federally-managed groundfish.
- Retention of species in the Other Flatfish complex is allowed when fishing with size #2 hooks or smaller (≤ 11 mm from point to shank) for Pacific sanddabs.
- A two-fish bag limit for bocaccio in the northern RLMA (north of 40°10' N latitude to the Oregon/California border at 42° N latitude) and a one-fish bag limit south of 40°10' N latitude to the U.S./Mexico border within the 10-fish RCG daily bag limit.
- No retention of cowcod, canary, or yelloweye rockfish.
- Lingcod size limit of 24 inches with a daily bag limit of two fish.
- Notwithstanding other fishing opportunities for groundfish, lingcod may not be retained during January, February, March, and December.
- Waters of Cordell Bank less than 100 fm in depth are closed to fishing at all times.
- Recreational fishing for groundfish prohibited between the shoreline and the 10 fm (18 m) depth contour around the Farallon Islands and Noonday Rock.
- All divers (boats permitted while diving for rockfish or other closed species during closed periods provided no hook and line gear on board or in possession while diving to catch rockfish) and shore-based anglers would be exempt from the seasonal closures and depth restrictions for rockfish, greenlings, California scorpionfish, California sheephead, and ocean whitefish.
- Fishing is allowed within the Cowcod Conservation Areas shoreward of the 20 fm line when fishing is open for groundfish other than California scorpionfish, but including select non-groundfish species (California sheephead and ocean whitefish).

California recreational groundfish management measures that differ from status quo include the following:

- Combined rockfish + cabezon + greenling (RCG) complex daily bag limit of 10 fish, of which one can be a cabezon and two can be a greenling of the genus *Hexagrammos*.
- In the South Region, CA scorpionfish is open 12 months: 0-40 fm January-February, 0-60 fm in March-December.

The CDFG recommended recreational seasons and depth restrictions by region are summarized below.

2007-2008 CA Option H11=3

RCG SEASON BY REGION

Region	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
North region	---	---	---	---	> 30 fm Closed							
North Central	---	---	---	---	---	> 30 fm Closed						---
South Central - Monterey	---	---	---	---	---	> 40 fm Closed						---
South Central - Morro Bay	---	---	---	---	---	> 40 fm Closed						---
South Region	---	---	> 60 fm Closed									

NOTES AND KEY:
RCG = Rockfish, cabezon, greenlings
--- = Closed to boat-based fishing for RCG

ESTIMATED IMPACTS FROM OPTION:

	Estimated Impacts (mt)								
Region	Yelloweye	Canary	Cowcod	Bocaccio	Widow	Minor NS RF North	Minor NS RF South	CA Scorpionfish	Lingcod
North region	0.9	0.7	N/A	N/A	0	17.3	N/A	0	51
North Central	0.6	5.5	0	0.2	2.2	N/A	165	0	152
South Central - Monterey	0	0.4	0	6.5	0.8	N/A	93	0	26
South Central - Morro Bay	0	1.1	0	2.2	0.1	N/A	82	0	21
South Region	0	0.3	0.3	57.4	5.2	N/A	61	75	26
TOTAL CALIFORNIA	1.5	8	0.3	66.3	8.3	17.3	401	75	276

Adopt nearshore commercial recommendations and trip limits contained in Agenda Item F.6.c Supplemental CDFG Report 2.

Agenda Item F.6.e
Supplemental Motion in Writing
June 2006

OREGON DEPARTMENT OF FISH AND WILDLIFE MOTION ON FINAL ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

I move that the Council approve the following management measures for the 2007 and 2008 recreational and commercial nearshore groundfish fisheries as described in the Action Alternatives in the draft Environmental Impact Statement (DEIS) for final adoption.

RECREATIONAL

Action Alternative 3b (Chapter 2, DEIS, p. 90) with the following revisions (Table 1):

- Allow fishing in all-depth waters during the following time periods: January through March, and October through December.
- A Marine Fish Daily Bag Limit of 8 fish in aggregate.
- Stonewall Bank YRCA under the No Action Alternative (Chapter 2, DEIS, p. 55), as described by the following coordinates:

ID#	Degrees	Minutes	Degrees	Minutes
1	44	37.46	124	24.92
2	44	37.46	124	23.63
3	44	28.71	124	21.80
4	44	28.71	124	24.10
5	44	31.42	124	25.47

Table 1**:** ODFW preferred 2007-2008 Oregon recreational groundfish fishery management measures.

<table>
<tr><th colspan="12">Season Structure</th><th colspan="6">Bag/Length Limits</th></tr>
<tr><th colspan="12">Month</th><th rowspan="2">Marine Fish Daily Bag[a/]</th><th rowspan="2">Flatfish Daily Bag[b/]</th><th rowspan="2">Lingcod Daily Bag</th><th rowspan="2">Lingcod Length Limit</th><th rowspan="2">Cabezon Length Limit</th><th rowspan="2">Kelp Greenling Length Limit</th></tr>
<tr><th>J</th><th>F</th><th>M</th><th>A</th><th>M</th><th>J</th><th>J</th><th>A</th><th>S</th><th>O</th><th>N</th><th>D</th></tr>
<tr><td colspan="3">All depth</td><td colspan="6"><40 fm</td><td colspan="3">All depth</td><td>8</td><td>25</td><td>2</td><td>22</td><td>16</td><td>10</td></tr>
</table>

a/ Marine bag includes all species other than lingcod, salmon, steelhead, Pacific halibut, flatfish, surfperch, sturgeon, striped bass, pelagic tuna and mackerel species, and bait fish such as herring, anchovy, sardine and smelt

b/ Flatfish bag consists of all soles and flounders except Pacific halibut

Estimated impacts (mt) to overfished rockfish species under this suite of recreational management measures are:

Bocaccio[a/]	Canary	Cowcod[a/]	Darkblotched	POP	Widow	Yelloweye
	4.3		0	0	1.1	3.2

[a/] Bocaccio and Cowcod have not been declare overfished off Oregon.

COMMERCIAL

Commercial Limited Entry Fixed Gear and Open Access Fisheries

Adopt a 22-inch length limit for lingcod off Oregon and Washington (north of 42°00’ N. latitude) for the limited entry fixed gear and open access fisheries.

Commercial Limited Entry Bottom Trawl Fishery

Provide the ability to implement a “one-gear-on-board” per cumulative period regulation in the bottom trawl fishery as a routine management measure.

Commercial Nearshore Fisheries North of 40°10’ N. Latitude.

Action Alternative 3b as described in Chapter 2 of the DEIS (p. 88), absent any modifications.

Estimated impacts (mt) to overfished rockfish species under this suite of commercial nearshore management measures are:

Bocaccio	Canary	Cowcod[a/]	Darkblotched	POP	Widow [a/]	Yelloweye
0	1.7	0.1	0	0	0.1	2.1

[a/] This amount is combine for commercial nearshore fisheries north and south of 40°10’ N. latitude

TRIBAL MOTION ON FINAL ADOPTION OF 2007-2008 GROUNDFISH FISHERY SPECIFICATIONS/MANAGEMENT MEASURES AND AMENDMENT 16-4

Mr. Chairman,
I move that, for the 2007-2008 management cycle, the Council adopt as final the Proposed Treaty Indian Management Measures presented under Agenda Item F.2.b.